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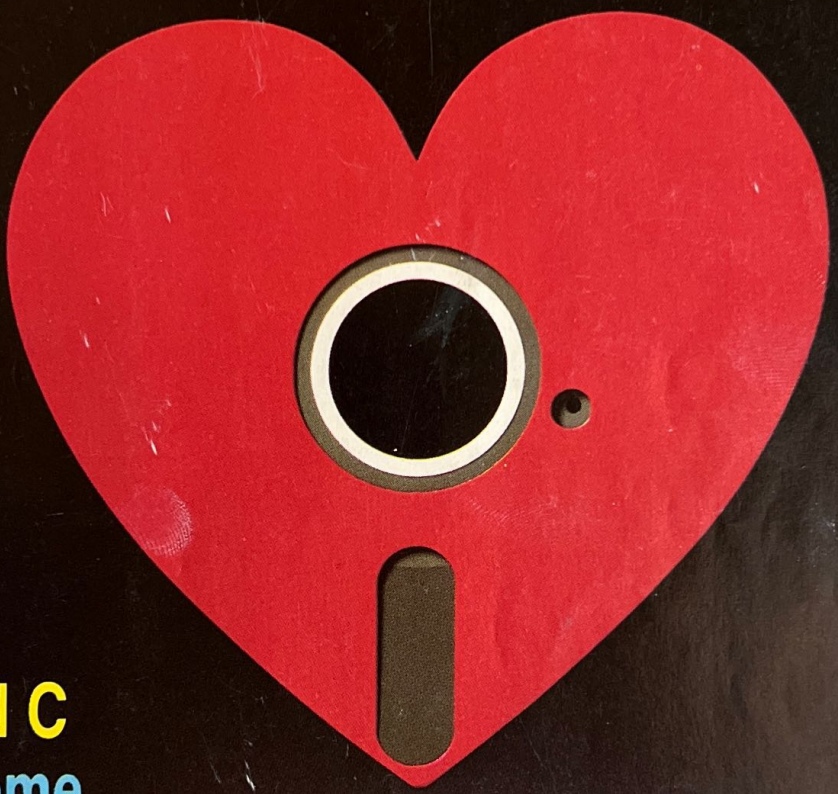
The Monthly Magazine For Sanyo Personal Computer Users

Mixing Colors On The Sanyo Palette



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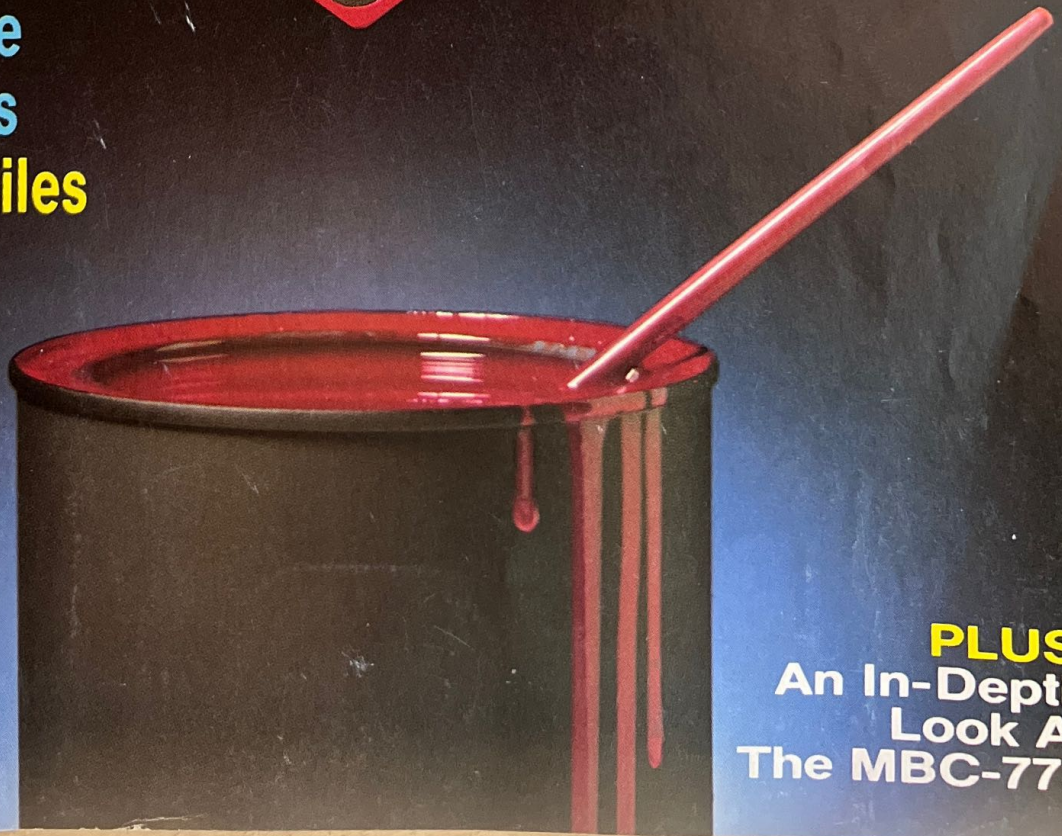

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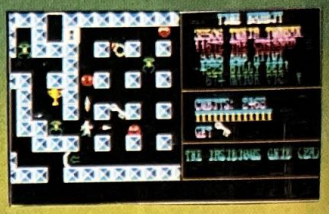

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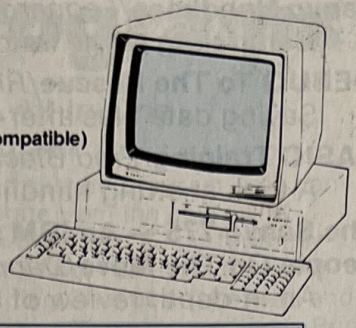

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LETTERS TO THE EDITOR

PAR AVION

HOW TO TRASH A DISK (IN ONE EASY LESSON)

Editor:

While running programs like *Font* (September '84) and *Sketch-It* (December '84) — programs that create a file on the default disk — I often forget to replace the MS-DOS system disk with the work disk. When the program tries to create a file, it comesback with a write protect error. No problem: I take out the system disk and replace it with the work disk and press 'R' for Retry. The program works fine, but the work disk is now filled with the system disk commands.

Why does it do this? And why does it write over my programs on the work disk instead of returning a disk full error?

A. Scott Hunter
Villa Rica, GA

Editor's Note: The problem is that when MS-DOS begins a write operation, it checks the File Allocation Table (FAT), a hidden area of the directory, to determine where space is available on the disk. When you change the disk after encountering the write protect error and hit 'R' for Retry, MS-DOS proceeds to write the file in accordance with the FAT of the first disk, not bothering to recheck it before writing. Obviously, this causes files to be overwritten, unless, of course, you're very lucky or your second disk is unused. Also, since the FAT and directory of the first disk are in memory, they are written to the second disk during the directory update. Your DOS command files, although not actually on the disk, will appear in the directory.

In other words, any time you change the active disk after encountering a write error of any type, it's a wise move to abort the command and issue it again.

SILVER RIBBONS

Editor:

I am grateful for a magazine as informative as SOFT SECTOR. It is the only magazine I have ever read that I read from cover to cover, word for word, including all the advertisements.

I have a Sanyo MBC-555-1, 256K, and a Sanyo PR-5500 printer. I need to know more information about the ribbons and print wheels used on the printer. I cannot find these items listed under Sanyo in catalogs. What is the manufacturer's name and model number for the ribbons and print wheels or what other commonly known printers use the same ribbons and print wheels.

Keep up the good work.

Gene Johnson
Madison, AL 35758

Editor's Note: The Sanyo PR-5000 and PR-5500 daisy wheel printers are manufactured by Silver-Reed, and their print wheels and ribbons are compatible. We cannot locate any part numbers that would be of any service to you, but any dealer carrying Silver-Reed products should be able to help.

THE SINGLE-SIDED SYNDROME

Editor:

If any owners of idle 160K drives from their upgrade into double-sided disks are listening, I've got some encouraging news.

Sure you can convert your old drives into useful working drives, but I don't know how. I knew there had to be something better for my drives than just collecting dust in the closet, though. Well, there is! I have discovered that a market exists for used and unwanted drives, especially the TEACs.

A firm, comfortably convenient to my location, will buy your old Sanyo single-sided drives for an impressive $50 each. I got a check for $100 after upgrading. But here's the big one: the company which bought my used drives is also an advertiser in SOFT SECTOR — J&M Systems, Ltd. in Albuquerque, N.M. [137 Utah N.E., 87108, 505-292-4182].

I would suggest writing or calling them before you send your drives — I'm sure there's some postage and handling costs to consider. Or you may do a little investigative reporting and locate a firm near you which will also purchase your unwanted drives, perhaps for even more profit.

Scott Barnes
Sante Fe, NM

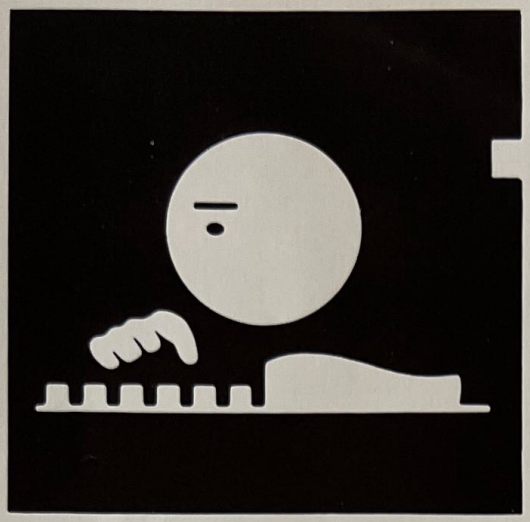
OUTPUT TO THE VOID

Editor:

Let me add another voice to the congratulations and thank you for SOFT SECTOR. After digesting the handbooks that came with my Sanyo, I am learning more from your publication than from any other source. However, I have some minor complaints about two of your reviews: *M-Disk* (September '84) and *Spooler* (November '84). Neither review was very thorough. The review of *M-Disk* was limited to its use with *WordStar* and the review of *Spooler* was limited to *Easy Writer*.

I had previously purchased *Spooler* and I'm somewhat disappointed with it. I don't use *Easy Writer* and the program does not work very well with *WordStar* or *CalcStar*. (With the former, the computer is not

Continued on page 69



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A demonstration program of the wide range of colors available for use in your Hi-Res graphics programs

Color Mixing On The Sanyo Palette

By David W. Neuendorf

One of the features that makes the MBC-550 series computers stand out from the crowd is the availability of eight colors for high resolution graphics programming. Many people may not realize that even this relatively large choice of colors may be vastly expanded. This article will discuss the principles of mixing colors as applied to the Sanyo computers. (For a very good, detailed explanation of computer color generation, see Lee Baldwin's "Color Considerations," *Byte*, September, 1984.) A short demonstration program will show some of the colorful possibilities.

The human eye was designed to be most sensitive to frequencies of light roughly corresponding to red, green and blue. Most of the color that we see can therefore be approximated by mixtures of these "primary" colors at various intensities. That is why color television sets and color computer monitors produce all of their colors by mixing the primaries. If you look

(Dave Neuendorf holds a B.S. in chemistry, an M.S. in metallurgy, and is currently employed as an extractive metallurgist. He programs in 6502 and 8086 assembler, BASIC and FORTH. Dave and his wife Patti, a computer analyst, have established a software development firm, NeuSystems. The author may be contacted at 281 Continental Dr., Pottstown, PA 19464, 215-327-2970.)

PHOTOS BY NEAL C. LAURON AND TERRY WILBERT

closely at the screen of a color TV or monitor, preferably in an area where white is being displayed, you will see the grid of red, green and blue dots that make up the picture. Examining your RGB monitor with Sanyo colors displayed, you may also discover that yellow is made up of red and green dots, cyan is made from blue and green, and magenta comes from red and blue. Since the Sanyo can only control the on/off state of each primary color in a pixel, these six are the only colors available in a single pixel, apart from black (no colors on) and white (all colors on).

To produce more colors than the three primaries and their complements (yellow, cyan and magenta), the computer must be able to control the average intensity of each primary color within the area of a pixel. We cannot do that on an individual pixel basis because the Sanyo designers understandably wanted to limit the amount of memory used by the display (already 48K!). More control of colors *at a given resolution* requires more memory. We can, however, control the average intensity of the primary colors over an area larger than one pixel. This is done by mixing pixels of different colors chosen to give the desired average mixture of primary color intensities.

The demonstration programs of Listing 1 (for 256K machines) and Listing 2 (for machines with less than 256K) present three hexagonal arrays of mixed colors. (Separate versions are provided depending on available memory in order to take advantage of BASIC's GET and PUT commands when available.)

Primary colors (red, green, and blue) are located at alternating vertices of the first hexagonal array, while the complementary colors (yellow, cyan, and magenta) are found at intermediate vertices. Colored areas on the edges and within the array represent all possible 25:75, 50:50, and 75:25 mixtures of pairs of the six available colors. A 50:50 mixture of each primary with its own complement is shown twice to maintain symmetry. White in the center represents the mixture of all colors, although here it is produced directly without the program having to mix it. The other two hexagonal arrays are produced by mixing 1/3 black or white into each colored area on the original array.

"Most of the color that we see can be approximated by mixtures of the primary colors at various intensities."

A very acceptable 50:50 mix pattern can be produced simply by alternating vertical lines of the two colors. Horizontal lines do not work well because of the low resolution in that direction (only 200 scan lines). The 25:75 and 75:25 mix pattern used here was produced the same way, but with dotted lines for the 25 percent colors. This pattern exhibits a noticeable checkerboard effect for high contrast color pairs, but a very good blend in most cases. Black and white are blended in by replacing every third vertical line with a black or white line. The result is surprisingly good for many of the color mixes, but poor for the black/white blends with 50:50 mixes (a high-contrast pattern appears instead of a smooth color blend). Certainly it would be possible for someone to find a more complex mixing algorithm that would produce a smoother blend.

I hope this demonstration of Sanyo color mixing has shown you something of the potential for color on the Sanyo screen. What is needed now to make our programs more colorful is a machine language subroutine to fill areas on the screen rapidly with blended colors.

Listing 1: 256K Version

```
10 OPTION BASE 0:REM *** Start array indices at zero *********************
20 DIM HEXAGON(144),POSITION(2,60),PALLETTE(7000)
30 CLS:SYMBOL(0,100),"Calculating...",5,2,4
40 COUNT=0:REM ************************************************************
50 FOR Y=0 TO 4:REM                          These loops calculate the posi-
60 FOR X=0 TO Y+4:REM                        tions of the small hexagons
70 POSITION(0,COUNT)=220-Y*21+X*44:REM       that contain the color samples,
80 POSITION(1,COUNT)=9+12*Y:REM              then store the coordinates in
90 COUNT=COUNT+1:REM                         a two-dimensional array.
100 NEXT X:REM
110 NEXT Y
120 FOR Y=5 TO 8
130 FOR X=0 TO 12-Y
140 POSITION(0,COUNT)=158+(Y-5)*21+X*44
150 POSITION(1,COUNT)=9+12*Y
160 COUNT=COUNT+1
170 NEXT X
180 NEXT Y:REM ************************************************************
190 CLS
200 LINE(240,9)-(220,12),7:REM ************ Draw a model hexagon **********
210 LINE(220,12)-(220,18),7
220 LINE(220,18)-(240,21),7
230 LINE(240,21)-(260,18),7
240 LINE(260,18)-(260,12),7
250 LINE(260,12)-(240,9),7
```

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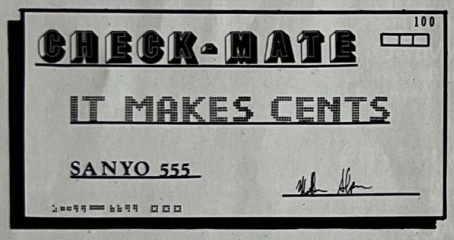
```
26Ø GET(22Ø,9)-(26Ø,21),HEXAGON:REM *** Store the hexagonal shape *********
27Ø RESTORE 52Ø:CLS
28Ø FOR A=Ø TO 6Ø:REM *** Place hexagons on screen, fill with colors ******
29Ø PUT(POSITION(Ø,A),POSITION(1,A)),HEXAGON,OR
3ØØ READ KOLOR:PAINT(1Ø+POSITION(Ø,A),5+POSITION(1,A)),KOLOR,7
31Ø READ MIXTYPE,MIXCOLOR:REM *** TYPE Ø = no mix, 1 = 5Ø:5Ø:, 2 = 25:75
32Ø IF MIXTYPE=Ø THEN 35Ø
33Ø IF MIXTYPE=1 THEN GOSUB 6ØØ:GOTO 35Ø
34Ø GOSUB 7ØØ
35Ø NEXT A:REM ************************************************************
36Ø FOR A=Ø TO 6Ø:REM *** Erase hexagonal boundaries after fill ************
37Ø PUT(POSITION(Ø,A),POSITION(1,A)),HEXAGON,OR
38Ø PUT(POSITION(Ø,A),POSITION(1,A)),HEXAGON,XOR
39Ø NEXT A:REM ************************************************************
4ØØ GET(12Ø,8)-(54Ø,18Ø),PALLETTE:REM *** Save basic pallette screen *******
41Ø LOCATE 2Ø,1,Ø
42Ø PRINT "Press B to mix in some black, W for white..."
43Ø Y$ = INKEY$:IF Y$ = "" THEN 43Ø:REM *** Wait for B/W choice ************
44Ø IF Y$ = "B" OR Y$ = "b" THEN GOSUB 9ØØ:GOTO 46Ø:REM *** Mix in black ***
45Ø IF Y$ = "W" OR Y$ = "w" THEN GOSUB 96Ø ELSE GOTO 41Ø:REM   or white ****
46Ø LOCATE 2Ø,1,Ø
47Ø PRINT "Press any key to restore normal pallette...":Y$=INKEY$
48Ø Y$=INKEY$:IF Y$ = "" THEN 48Ø:REM *** Wait for keystroke ***************
49Ø CLS:PUT(12Ø,8),PALLETTE:REM *** Restore pallette screen ****************
5ØØ GOTO 41Ø
51Ø READ MIXTYPE,MIXCOLOR:REM *** TYPE Ø = no mix, 1 = 5Ø:5Ø, 2 = 25:75
52Ø DATA 4,Ø,Ø,4,2,6,4,1,6,6,2,4,6,Ø,Ø,4,2,5,Ø,Ø,Ø,4,2,2,6,2,5:REM *********
53Ø DATA Ø,Ø,Ø,6,2,2,4,1,5,4,2,1,6,1,5,Ø,Ø,Ø,4,1,2,6,2,3,6,1,2:REM Color
```

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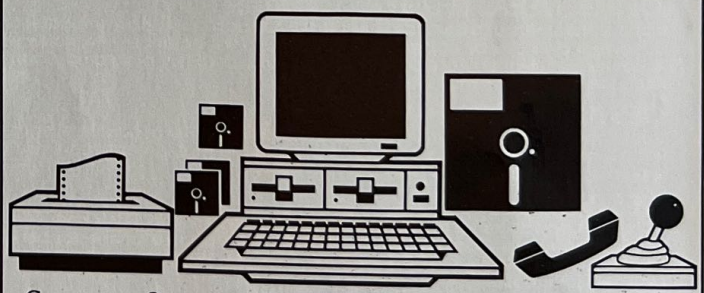

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```
54Ø DATA 5,2,4,5,2,6,Ø,Ø,Ø,4,1,3,6,1,1,Ø,Ø,Ø,2,2,4,2,2,6,5,Ø,Ø:REM mixing
55Ø DATA Ø,Ø,Ø,1,1,4,5,1,2,7,Ø,Ø,2,1,5,6,1,3,Ø,Ø,Ø,2,Ø,Ø,5,2,1:REM data
56Ø DATA 5,2,3,Ø,Ø,Ø,1,1,6,3,1,4,Ø,Ø,Ø,2,2,1,2,2,3,5,1,1,1,2,4
57Ø DATA 5,1,3,Ø,Ø,Ø,2,1,1,3,2,6,2,1,3,1,2,5,Ø,Ø,Ø,1,2,2,3,2,5
58Ø DATA Ø,Ø,Ø,3,2,2,1,Ø,Ø,1,2,3,1,1,3,3,2,1,3,Ø,Ø,Ø,Ø,Ø,3,Ø,Ø
59Ø DATA 1,Ø,Ø,1,Ø,Ø,1,Ø,Ø,3,Ø,Ø,3,Ø,Ø:REM **********************************
6ØØ COUNT=1:REM *** Subroutine to fill a hexagon with 5Ø:5Ø color mix *******
61Ø FOR X=POSITION(Ø,A)+1 TO POSITION(Ø,A)+19 STEP 2
62Ø LINE(X,POSITION(1,A)+4-.15*COUNT)-(X,POSITION(1,A)+8.5+.15*COUNT),MIXCOLOR
63Ø COUNT=COUNT+2
64Ø NEXT X
65Ø FOR X=POSITION(Ø,A)+21 TO POSITION(Ø,A)+39 STEP 2
66Ø LINE(X,POSITION(1,A)-2+.15*COUNT)-(X,POSITION(1,A)+15-.15*COUNT),MIXCOLOR
67Ø COUNT=COUNT+2
68Ø NEXT X
69Ø RETURN:REM ************************************************************
7ØØ COUNT=2:TEST1=Ø:REM *** Subroutine to fill with 25:75 color mix *********
71Ø FOR X=POSITION(Ø,A)+2 TO POSITION(Ø,A)+2Ø STEP 2
72Ø TEST=POSITION(1,A)+4-.15*COUNT
73Ø IF INT(TEST+.5)=INT(TEST1+.5) THEN TEST=TEST+1
74Ø TEST1=TEST
75Ø FOR Y=TEST TO POSITION(1,A)+8.5+.15*COUNT STEP 2
76Ø PSET(X,Y),MIXCOLOR
77Ø NEXT Y
78Ø COUNT=COUNT+2
79Ø NEXT X
8ØØ FOR X=POSITION(Ø,A)+22 TO POSITION(Ø,A)+38 STEP 2
81Ø TEST=POSITION(1,A)-2+.15*COUNT
82Ø IF INT(TEST+.5)=INT(TEST1+.5) THEN TEST=TEST+1
83Ø TEST1=TEST
84Ø FOR Y=TEST TO POSITION(1,A)+14.5-.15*COUNT STEP 2
85Ø PSET(X,Y),MIXCOLOR
86Ø NEXT Y
87Ø COUNT=COUNT+2
88Ø NEXT X
89Ø RETURN:REM ************************************************************
9ØØ RESTORE 52Ø:BWMIX = Ø:REM *** Subroutine to mix in black ***************
91Ø FOR A=Ø TO 6Ø
92Ø READ KOLOR,MIXTYPE,MIXCOLOR
93Ø GOSUB 97Ø
94Ø NEXT A
95Ø RETURN:REM ************************************************************
96Ø RESTORE 52Ø:BWMIX = 7:GOSUB 91Ø:RETURN:REM *** Subroutine to mix in white
97Ø IF KOLOR=Ø THEN RETURN:REM *** Subroutine to mix in black or white *****
98Ø COUNT=1
99Ø FOR X=POSITION(Ø,A)+1 TO POSITION(Ø,A)+19 STEP 3
1ØØØ LINE(X,POSITION(1,A)+4-.15*COUNT)-(X,POSITION(1,A)+8.5+.15*COUNT),BWMIX
1Ø1Ø COUNT=COUNT+3
1Ø2Ø NEXT X
1Ø3Ø FOR X=POSITION(Ø,A)+22 TO POSITION(Ø,A)+39 STEP 3
1Ø4Ø LINE(X,POSITION(1,A)-2+.15*COUNT)-(X,POSITION(1,A)+15-.15*COUNT),BWMIX
1Ø5Ø COUNT=COUNT+3
1Ø6Ø NEXT X
1Ø7Ø PUT(POSITION(Ø,A),POSITION(1,A)),HEXAGON,OR
1Ø8Ø PUT(POSITION(Ø,A),POSITION(1,A)),HEXAGON,XOR
1Ø9Ø RETURN:REM ************************************************************
```

Listing 2: 128K Version

```
1Ø OPTION BASE Ø:REM *** Start array index at zero ************************
```

```
2Ø DIM POSN(2,6Ø)
3Ø CLS:SYMBOL(Ø,1ØØ),"Calculating...",5,2,4
4Ø COUNT=Ø:REM ************************************************************
5Ø FOR Y=Ø TO 4:REM
6Ø FOR X=Ø TO Y+4:REM
7Ø POSN(Ø,COUNT)=22Ø-Y*21+X*44:REM
8Ø POSN(1,COUNT)=9+12*Y:REM
9Ø COUNT=COUNT+1:REM
1ØØ NEXT X
11Ø NEXT Y
12Ø FOR Y=5 TO 8
13Ø FOR X=Ø TO 12-Y
14Ø POSN(Ø,COUNT)=158+(Y-5)*21+X*44
15Ø POSN(1,COUNT)=9+12*Y
16Ø COUNT=COUNT+1
17Ø NEXT X
18Ø NEXT Y:REM ************************************************************
19Ø CLS
2ØØ RESTORE 41Ø:CLS
21Ø FOR A=Ø TO 6Ø:REM *** Draw the screen of hexagons **********************
22Ø EDGE=7:GOSUB 99Ø
23Ø READ KOLOR:PAINT(1Ø+POSN(Ø,A),5+POSN(1,A)),KOLOR,7
24Ø READ MIXTYPE,MIXCOLOR:REM *** TYPE Ø = no mix, 1 = 5Ø:5Ø:, 2 = 25:75
25Ø IF MIXTYPE=Ø THEN 28Ø
26Ø IF MIXTYPE=1 THEN GOSUB 49Ø:GOTO 28Ø
27Ø GOSUB 59Ø
28Ø EDGE=Ø:GOSUB 99Ø
29Ø NEXT A:REM ************************************************************
```

These loops calculate the positions of the small hexagons that contain the color samples, then store the coordinates in a two-dimensional array.

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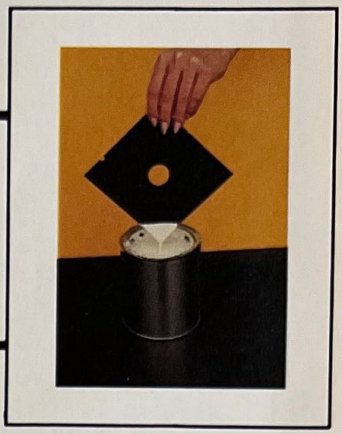
```
300 LOCATE 20,1,0
310 PRINT "Press B to mix in some black, W for white..."
320 Y$ = INKEY$:IF Y$ = "" THEN 320:REM *** Wait for B/W choice ************
330 IF Y$ = "B" OR Y$ = "b" THEN GOSUB 790:GOTO 350
340 IF Y$ = "W" OR Y$ = "w" THEN GOSUB 860 ELSE GOTO 300
350 LOCATE 20,1,0
360 PRINT "Press any key to restore normal pallette...":Y$=INKEY$
370 Y$=INKEY$:IF Y$ = "" THEN 370
380 CLS
390 GOTO 200:REM *** Restore pallette screen ******************************
400 READ MIXTYPE,MIXCOLOR:REM *** TYPE 0 = no mix, 1 = 50:50, 2 = 25:75
410 DATA 4,0,0,4,2,6,4,1,6,6,2,4,6,0,0,4,2,5,0,0,0,4,2,2,6,2,5:REM **********
420 DATA 0,0,0,6,2,2,4,1,5,4,2,1,6,1,5,0,0,0,4,1,2,6,2,3,6,1,2:REM Color
430 DATA 5,2,4,5,2,6,0,0,0,4,1,3,6,1,1,0,0,0,2,2,4,2,2,6,5,0,0:REM mixing
440 DATA 0,0,0,1,1,4,5,1,2,7,0,0,2,1,5,6,1,3,0,0,0,2,0,0,5,2,1:REM data
450 DATA 5,2,3,0,0,0,1,1,6,3,1,4,0,0,0,2,2,1,2,2,3,5,1,1,1,2,4
460 DATA 5,1,3,0,0,0,2,1,1,3,2,6,2,1,3,1,2,5,0,0,0,1,2,2,3,2,5
470 DATA 0,0,0,3,2,2,1,0,0,1,2,3,1,1,3,3,2,1,3,0,0,0,0,0,3,0,0
480 DATA 1,0,0,1,0,0,1,0,0,3,0,0,3,0,0:REM **********************************
490 COUNT=1:REM *** Subroutine to fill a hexagon with 50:50 color mix *******
500 FOR X=POSN(0,A)+1 TO POSN(0,A)+19 STEP 2
510 LINE(X,POSN(1,A)+4-.15*COUNT)-(X,POSN(1,A)+8.5+.15*COUNT),MIXCOLOR
520 COUNT=COUNT+2
530 NEXT X
540 FOR X=POSN(0,A)+21 TO POSN(0,A)+39 STEP 2
550 LINE(X,POSN(1,A)-2+.15*COUNT)-(X,POSN(1,A)+15-.15*COUNT),MIXCOLOR
560 COUNT=COUNT+2
570 NEXT X
580 RETURN:REM ****************************************************************
590 COUNT=2:TEST1=0:REM *** Subroutine to fill with 25:75 color mix *********
600 FOR X=POSN(0,A)+2 TO POSN(0,A)+20 STEP 2
610 TEST=POSN(1,A)+4-.15*COUNT
620 IF INT(TEST+.5)=INT(TEST1+.5) THEN TEST=TEST+1
630 TEST1=TEST
640 FOR Y=TEST TO POSN(1,A)+8.5+.15*COUNT STEP 2
650 PSET(X,Y),MIXCOLOR
660 NEXT Y
670 COUNT=COUNT+2
680 NEXT X
690 FOR X=POSN(0,A)+22 TO POSN(0,A)+38 STEP 2
700 TEST=POSN(1,A)-2+.15*COUNT
710 IF INT(TEST+.5)=INT(TEST1+.5) THEN TEST=TEST+1
720 TEST1=TEST
730 FOR Y=TEST TO POSN(1,A)+14.5-.15*COUNT STEP 2
740 PSET(X,Y),MIXCOLOR
750 NEXT Y
760 COUNT=COUNT+2
770 NEXT X
780 RETURN:REM ****************************************************************
790 RESTORE 410:BWMIX = 0:REM *** Subroutine to mix in black ***************
800 FOR A=0 TO 60
810 READ KOLOR,MIXTYPE,MIXCOLOR
820 GOSUB 870
830 EDGE=0:GOSUB 990
840 NEXT A
850 RETURN:REM ****************************************************************
860 RESTORE 410:BWMIX = 7:GOSUB 800:RETURN:REM Subroutine to add white *****
870 IF KOLOR=0 THEN RETURN:REM *** Subroutine to mix in black or white *****
880 COUNT=1
```

```
89Ø FOR X=POSN(Ø,A)+1 TO POSN(Ø,A)+19 STEP 3
9ØØ LINE(X,POSN(1,A)+4-.15*COUNT)-(X,POSN(1,A)+8.5+.15*COUNT),BWMIX
91Ø COUNT=COUNT+3
92Ø NEXT X
93Ø FOR X=POSN(Ø,A)+22 TO POSN(Ø,A)+39 STEP 3
94Ø LINE(X,POSN(1,A)-2+.15*COUNT)-(X,POSN(1,A)+15-.15*COUNT),BWMIX
```



```
95Ø COUNT=COUNT+3
96Ø NEXT X
97Ø RETURN:REM ************************************************************
98Ø REM *** Subroutine to draw one small hexagon ***************************
99Ø LINE(2Ø+POSN(Ø,A),POSN(1,A))-(POSN(Ø,A),3+POSN(1,A)),EDGE
1ØØØ LINE(POSN(Ø,A),3+POSN(1,A))-(POSN(Ø,A),9+POSN(1,A)),EDGE
1Ø1Ø LINE(POSN(Ø,A),9+POSN(1,A))-(2Ø+POSN(Ø,A),12+POSN(1,A)),EDGE
1Ø2Ø LINE(2Ø+POSN(Ø,A),12+POSN(1,A))-(4Ø+POSN(Ø,A),9+POSN(1,A)),EDGE
1Ø3Ø LINE(4Ø+POSN(Ø,A),9+POSN(1,A))-(4Ø+POSN(Ø,A),3+POSN(1,A)),EDGE
1Ø4Ø LINE(4Ø+POSN(Ø,A),3+POSN(1,A))-(2Ø+POSN(Ø,A),POSN(1,A)),EDGE
1Ø5Ø RETURN:REM ************************************************************
```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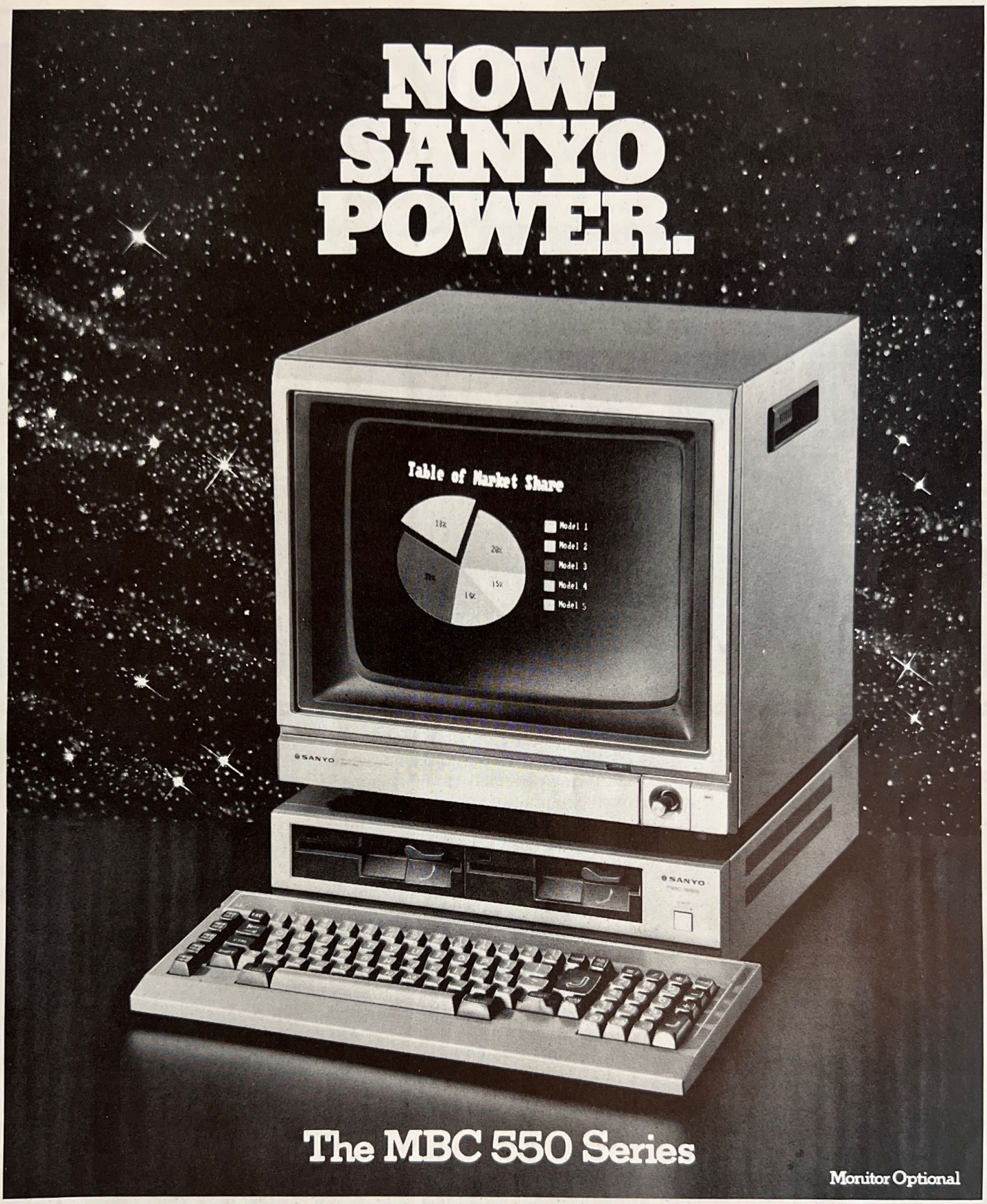

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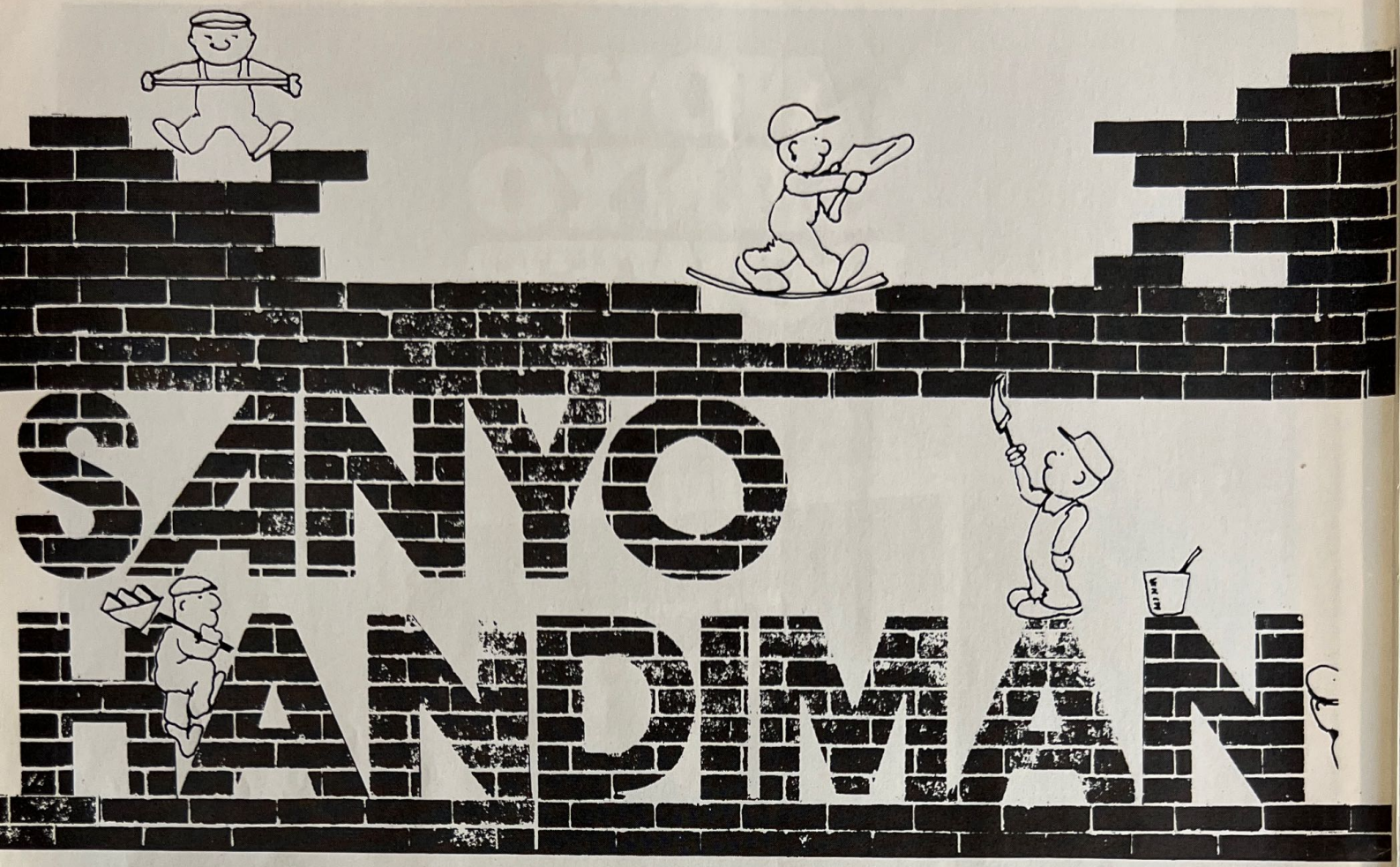

By Leonard Hyre

(Leonard Hyre works as a claims representative for the Social Security Administration. He has written several articles for THE RAINBOW and has written commerical programs for the TRS-80 Color Computer, the Apple II, the Commodore and the TI-99 computers. The author may be contacted at P.O. Box 403, Cambridge, MD 21613, 301-228-0064.)

The practicality of the home computer is an object bound to bring extremely varied responses from the computing and non-computing world. (Yes, there is rumor of a non-computing world!). *Sanyo-Handiman* seeks to come to the defense of the machines we all cherish. This program does all the calculating of materials and costs for a variety of home projects, allowing the user to compare many factors rather than jumping into a job blindly. Options include painting, wallpapering, carpeting, tiling, concrete pouring and paneling.

Like many Sanyo users, I am a graduate of a less powerful machine and anxious to flex those newly found computing muscles. The natural thing to do is convert some of the old standbys into Sanyo BASIC. *Sanyo-Handiman* started as such a project. The result is a program far superior to the original. With the 80-character display and the ability to mix graphics and text, the Sanyo couldn't help but inspire some new ideas to complement the program.

I have made liberal use of SYMBOL and LINE in creating informative screens to act as reminders to the would-be handyman. Also, for those of you who are not familiar with powerful PRINT USING variations, you may find the program listing of interest.

From the menu, the user is offered six options (as listed above). The basic screen format for the paneling and painting options is shared as is the format for carpeting and tiling. Wallpapering and concreting each get separate graphics treatments. The user in each case is prompted for the information needed to complete the job estimate. Following screen display of the results, the user is given the option of a printout of the information. Generic printer routines are used, so you won't have any problems with printouts.

I realize the listing is a long one, but I believe you will be pleased with the results. *Sanyo-Handiman* can really be a handy program to have in your software collection. If the thought of the typing overwhelms you, just send me $8, your name and address and I'll be happy to send you *Sanyo-Handiman* on disk.

```
 5Ø '************************************************
 6Ø '*     SANYO-HANDIMAN     L.HYRE      11/84     *
 7Ø '*     PO BOX 4Ø3   CAMBRIDGE    MD   21613     *
 8Ø '************************************************
 9Ø '
 1ØØ CLEAR:COLOR 4,7:CLS:GOSUB  148Ø:PRINT STRING$(8Ø,"*"):SYMBOL(9Ø,1Ø)," S A N
 Y O * H A N D I M A N ",2,2,4:LOCATE 5,1:PRINT STRING$(8Ø,246);:LOCATE 6,35:SYMB
 OL(25Ø,45),"THE MENU ",2,2,1:LOCATE 1,1
 13Ø SYMBOL(23Ø,65),"1. PANELING",2,1,4
 14Ø SYMBOL(23Ø,75),"2. PAINTING",2,1,4
 15Ø SYMBOL(23Ø,83),"3. WALLPAPER",2,1,4
 16Ø SYMBOL(23Ø,91),"4. CARPETING",2,1,4
 17Ø SYMBOL(23Ø,99),"5. CONCRETE",2,1,4:SYMBOL(23Ø,1Ø7),"6. TILES",2,1,4
 18Ø OUT &H38,5Ø:SYMBOL(255,15Ø),"YOUR CHOICE?",1,2,1: OUT &H38,5Ø
 19Ø LOCATE 21,45
 2ØØ AN$=INKEY$
 21Ø IF AN$=""THEN 2ØØ
 22Ø IF AN$="1"THEN S1$="PANELING"
 23Ø IF AN$="2"THEN S1$="PAINTING"
 24Ø ON INSTR("123456",AN$)GOTO 26Ø,26Ø,74Ø,1ØØØ,15ØØ,1ØØØ
 25Ø GOTO 2ØØ
 26Ø CLS:LINE(38Ø,8Ø)-(6ØØ,13Ø),1,B:LINE(44Ø,1ØØ)-(47Ø,128),1,B:LINE(525,1ØØ)-(57
 5,118),1,B:PAINT(445,112),6,1:PAINT(53Ø,11Ø),3,1:PAINT(382,85),2,1
 27Ø SYMBOL(36Ø,78),"-HEIGHT-",1,1,Ø,1:SYMBOL(38Ø,136),"<-----     WIDTH      ---
 -->",1,1,Ø
 28Ø LOCATE 12,56:COLOR Ø,2:PRINT"DOOR":LOCATE 12,67:PRINT"WINDOW":LOCATE 4,1:COL
 OR Ø,7
 29Ø GOSUB 144Ø:PRINT STRING$(8Ø,"*"):SYMBOL(5,1Ø),"MEASUREMENTS---",3,2,4
 3ØØ SYMBOL(38Ø,1Ø),S1$,3,2,1
 31Ø LOCATE 5,2:PRINT"HT OF WALL(FT/IN.)":INPUT" FT. ";HA$:GOSUB  144Ø:INPUT" IN"
 ;HB$:GOSUB  144Ø
 32Ø PRINT" WIDTH A (FT/IN)":LINE INPUT" FT?";WF$:LINE INPUT" IN?";WI$:GOSUB  144
 Ø:INPUT" NO.OF WALLS THIS SIZE";AZ:GOSUB  144Ø:PRINT" WIDTH B (FT/IN)":LINE INPU
 T" FT?";WG$:LINE INPUT" IN?";WJ$:GOSUB  144Ø:INPUT" NO.OF WALLS THIS SIZE";AX:GO
 SUB  146Ø
 33Ø INPUT" NO.OF REGULAR WINDOWS";WN:GOSUB  144Ø
 34Ø INPUT" NO.OF PICTURE WINDOWS";WP:GOSUB  144Ø:OQ=WP
 35Ø INPUT" NO.OF DOORS";DR:GOSUB  144Ø
 36Ø ZZ=VAL(HA$)*12+VAL(HB$)
 37Ø ZY=VAL(WF$)*12+VAL(WI$)
 38Ø ZX=VAL(WG$)*12+VAL(WJ$)
 39Ø WA=WN*1152:WP=WN*23Ø6:DA=DR*198Ø:RE=WA+WP+DA
 4ØØ GOSUB  148Ø
 41Ø GA=(ZZ*ZY)*AZ+(ZZ*ZX)*AX:GA=GA-RE
 42Ø NF=INT(GA/144):NI=GA-(NF*144)
 43Ø IF AN$="1"THEN  44Ø  ELSE IF AN$="2"THEN 53Ø ELSE IF AN$="3"THEN 74Ø
 44Ø PRINT STRING$(8Ø,"_");:PRINT" WHAT ROOM ARE WE WORKING WITH? ";
 45Ø LINE INPUT RM$:IF RIGHT$(RM$,4)<>"ROOM" THEN RM$=RM$+" ROOM":GOSUB  144Ø
 46Ø NP=INT(NF/32)+1
 47Ø PRINT" PANEL CALCULATIONS: ";
 48Ø PRINT" TO DO THE ";:PRINT RM$;" YOU WILL NEED APPROXIMATLEY ":PRINT" A TOTAL
  OF ";:PRINT USING"#####,.#";NP;:PRINT" SHEETS OF PANEL."
 49Ø PRINT" PRINT THIS (Y/N)";
 5ØØ LQ$=INKEY$:IF LQ$=""THEN 5ØØ
 51Ø IF LQ$="Y"THEN GOSUB  217Ø
 52Ø RUN 1ØØ
 53Ø LOCATE 19,1:PRINT STRING$(8Ø,"_");:PRINT" PAINTING CALCULATIONS: ";
 54Ø PRINT" WHAT ROOM ARE WE WORKING WITH? ";
```

```
55Ø LINE INPUT RM$:IF RIGHT$(RM$,4)<>"ROOM" THEN RM$=RM$+" ROOM":GOSUB  144Ø
56Ø PRINT" COST OF PAINT/GALLON?$";:LINE INPUT CG$:GOSUB 144Ø
57Ø LOCATE 21,4Ø:PRINT"     HOW MANY COATS WILL  YOU APPLY? ";:LINE INPUT NC$:GO
SUB 144Ø
58Ø PRINT" HOW MANY SQ.FT/GAL.DOES MFG.RECOMEND?";:LINE INPUT FG$:GOSUB 144Ø
59Ø LOCATE 23,2:PRINT"WILL YOU DO CEILING?(Y/N)":GOSUB 144Ø
6ØØ A$=INKEY$:IF A$=""THEN 6ØØ
61Ø IF A$ <>"Y" THEN 64Ø
62Ø NF=((ZY*ZX)/144)+NF
63Ø FOR DL= 1 TO 8ØØ:NEXT
64Ø FOR WIPE=2Ø TO 24:LOCATE WIPE,1:PRINT SPACE$(8Ø);:NEXT WIPE
65Ø LOCATE 2Ø,1:PRINT" PAINTING CALCULATIONS     "
66Ø PRINT" TO PAINT THE ";RM$;:PRINT" YOU WILL NEED ";:GN=INT(NF/VAL(FG$)*VAL(NC
$)+1):PRINT USING"#####,.#";GN;:PRINT" GALLONS."
67Ø PRINT" THE APPROXIMATE COST WILL  BE";
68Ø CG=VAL(CG$):CP=GN*CG
69Ø PRINT USING"$#####,.##";CP
7ØØ PRINT " PRINT THIS <Y/N>?"
71Ø OG$=INKEY$:IF OG$=""THEN 71Ø
72Ø IF OG$="Y"THEN GOSUB 222Ø
73Ø RUN 1ØØ
74Ø COLOR Ø,2:CLS:PRINT STRING$(8Ø,2Ø2):SYMBOL(7Ø,8),"WALLPAPER CALCULATION",3,2
,4:LOCATE 4,1:PRINT STRING$(8Ø,2Ø2)
75Ø LINE(3Ø9,119)-(618,185),Ø,B
76Ø COLOR 4,7:PPR$=STRING$(38,CHR$(1)):FOR PAPER=16 TO 23:LOCATE PAPER,4Ø:PRINT
PPR$;:NEXT PAPER
77Ø LINE(35Ø,13Ø)-(4ØØ,183),6,BF:LINE(48Ø,13Ø)-(55Ø,165),Ø,B:LINE(5Ø5,13Ø)-(485,
15Ø),Ø:LINE-(5Ø5,165),Ø:LINE(525,13Ø)-(545,15Ø),Ø:LINE-(525,165),Ø:PAINT(5ØØ,133
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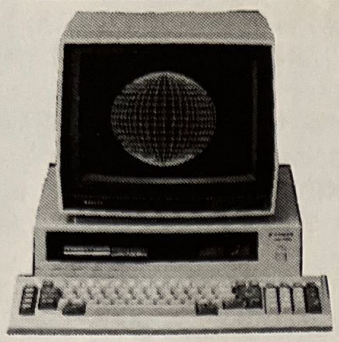

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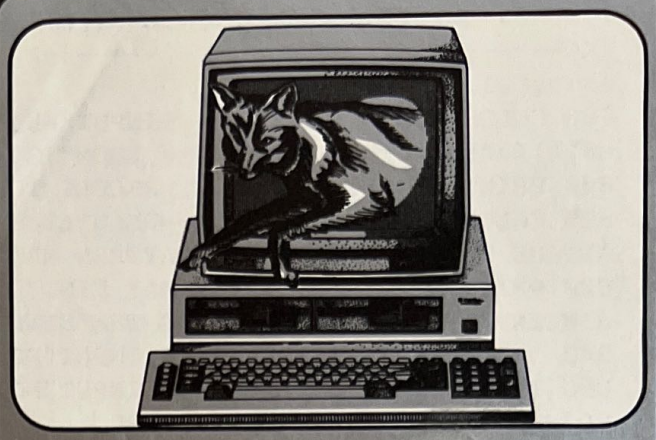

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```
),5,Ø:PAINT(53Ø,132),5,Ø:PAINT(515,135),3,Ø:CIRCLE(39Ø,155),3
78Ø HE$=CHR$(27)+"HEIGHT"+CHR$(26):SYMBOL(3Ø6,12Ø),HE$,1,1,Ø,1:SYMBOL(316,19Ø),"
<<<-------       WIDTH      ------->>>",1,1,Ø:SYMBOL(362,1Ø2),"Sample for Wallpap
ering",1,2,Ø
79Ø COLOR Ø,2:LOCATE 5,1:  INPUT"WHAT ROOM ARE WE WORKING WITH ";RM$:IF RIGHT$(R
M$,4)<>"ROOM"THEN RM$=RM$+" ROOM":GOSUB 144Ø
8ØØ PRINT"MEASURE & RAISE  RESULT TO THE  NEXT WHOLE FOOT!
81Ø COLOR 1,2:PRINT"NOTE:  WE WILL BE USING STANDARD 36 SQ.FT. ROLL   FOR CALCUL
ATIONS WITH 6 SQ.FT FOR  PATTERN MATCH. ";
82Ø PRINT"ON OCCASION YOU MAY FIND DOUBLE LENGTH ROLLS OF 72 SQ.FT.":COLOR Ø,2
83Ø INPUT"WILL YOU BE USING THE'SINGLE' SIZE <Y/N>";SS$
84Ø INPUT"WIDTH WALL A";WA$:INPUT"NO.WALLS THIS SIZE";NW
85Ø INPUT"WIDTH WALL B";WB$:INPUT"NO.WALLS THIS SIZE";SB
86Ø TW=VAL(WA$)*NW+VAL(WB$)*SB
87Ø INPUT"HEIGHT OF WALLS";HW:INPUT"NO.OF WINDOWS";NZ:INPUT"NO.OF DOORS";ND
88Ø RP=(TW*HW)/3Ø-(INT(NZ)/2+ND)+1:IF SS$="N"THEN RP=RP/2
882 RO=INT(RP)+1
89Ø INPUT"COST PER ROLL";CR
9ØØ COLOR Ø,7:FOR XN=18 TO 22:LOCATE XN,1:PRINT SPACE$(36);:NEXT
91Ø LOCATE 18,2
92Ø PRINT"TO WALLPAPER THE ";RM$
93Ø PRINT" YOU NEED ";RO;" ROLLS"
94Ø PRINT:PRINT" YOUR COST IS ";
95Ø PRINT USING"$#####,.##";CR*RO
96Ø PRINT" PRINT THIS? <Y/N>"
97Ø OG$=INKEY$:IF OG$=""THEN 97Ø
98Ø IF OG$="Y"THEN GOSUB  227Ø
99Ø RUN 1ØØ
1ØØØ COLOR Ø,6:CLS:PRINT STRING$(8Ø,"*"):IF AN$="4"THEN SY$="CARPETING A ROOM" E
LSE IF AN$="6"THEN SY$="*  TILING A ROOM  *"
1Ø1Ø SYMBOL(18Ø,1Ø),SY$,2,3,4
1Ø2Ø LOCATE 5,1:PRINT STRING$(8Ø,"*");
1Ø3Ø LINE(36Ø,14Ø)-(62Ø,19Ø),1,B:LINE(45Ø,14Ø)-(5ØØ,156),1,B:LINE(62Ø,16Ø)-(636,
184),1,BF:PAINT(38Ø,145),7,1:PAINT(455,142),4,1
1Ø4Ø LINE(38Ø,138)-(43Ø,142),Ø,B:LINE(55Ø,138)-(6ØØ,142),Ø,B:LINE(358,15Ø)-(362,
17Ø),Ø,B
1Ø5Ø LOCATE 14,46:PRINT"TERMS TO UNDERSTAND:":LOCATE 15,46:PRINT"1-MAIN ROOM ARE
A":LOCATE 16,46:PRINT"2-CUT OUTS":LOCATE 17,46:PRINT"3-ADD ONS"
1Ø6Ø COLOR ,4:LOCATE 19,59:PRINT "<2>":COLOR ,1:LOCATE 22,79:PRINT"3":COLOR ,7:L
OCATE 23,59:PRINT"<1>":COLOR ,6:LOCATE 25,55:PRINT" Sample Floor Plan";
1Ø7Ø LOCATE 6,2:PRINT"WHICH ROOM ARE WE WORKING WITH";:INPUT RM$:IF RIGHT$(RM$,4
)<>"ROOM"THEN RM$=RM$+" ROOM"
1Ø8Ø IF AN$="4"THEN PRINT" MEASURING FOR  CARPET: ";:ELSE IF AN$="6"THEN PRINT"
MEASURING FOR TILES: ";
1Ø9Ø COLOR 4:IF AN$="4"THEN PRINT" USE NEAREST FOOT FOR  MEASUREMENT";:ELSE IF A
N$="6"THEN PRINT" PLEASE -ENTER TOTAL NUMBER INCHES";
11ØØ COLOR Ø:LOCATE 8,2:INPUT "WIDTH MAIN AREA";WM:GOSUB 144Ø:LOCATE 8,4Ø:INPUT"
 LENGTH MAIN AREA";LM:GOSUB  144Ø
111Ø PRINT" ADD-ON  Areas (Y/N)":GOSUB 144Ø
112Ø A1$=INKEY$:IF A1$=""THEN 112Ø
113Ø LOCATE 9,1:PRINT SPACE$(2Ø):LOCATE 9,1
114Ø LOCATE 9,1:IF A1$="Y"THEN INPUT" WIDTH  ";AW:LOCATE 9,4Ø:INPUT" LENGTH ";AL
:FOR TI=1 TO 6ØØ:NEXT:LOCATE 9,1:PRINT SPACE$(78);:LOCATE 9,1
115Ø IF A1$<>"Y"THEN  121Ø
116Ø LOCATE 9,1:PRINT SPACE$(78):LOCATE 9,1:PRINT" OK. ANY MORE? (Y/N)":GOSUB  1
46Ø
117Ø A2$=INKEY$:IF A2$=""THEN 117Ø
118Ø LOCATE 9,1:PRINT SPACE$(2Ø);:LOCATE 9,1
119Ø IF A2$="Y" THEN COLOR 4:COLOR 4:PRINT" ADD ALL REMAINING ADD-ONS TOGETHER!"
```

```
:COLOR Ø
12ØØ IF A2$="Y"THEN INPUT" WIDTH  ";BW:GOSUB 144Ø:LOCATE 1Ø,4Ø:INPUT" LENGTH ";B
L:GOSUB 144Ø
121Ø IF AN$="4"THEN JQ$="FOOT"
122Ø IF AN$="6"THEN JQ$="INCH"
123Ø FOR WIPE=9 TO 11:LOCATE WIPE,1:PRINT SPACE$(78);:NEXT:LOCATE 9,1
124Ø PRINT" NOW:'CUT-OUTS'(MEASURE TO NEAREST ";JQ$;")":COLOR 4
125Ø PRINT" ARE THERE ANY? ( Y/N  )":GOSUB  146Ø:COLOR Ø
126Ø A3$=INKEY$:IF A3$=""THEN 126Ø
127Ø IF A3$<>"Y"THEN 133Ø
128Ø IF A3$="Y"THEN PRINT" WIDTH ";:INPUT CW:GOSUB 144Ø:LOCATE 11,4Ø:INPUT" LENG
TH ";CL:GOSUB 144Ø:LOCATE 9,1:PRINT SPACE$(236):LOCATE 9,1
129Ø PRINT" ANY MORE 'CUT-OUTS'?"
13ØØ A4$=INKEY$:IF A4$=""THEN 13ØØ
131Ø FOR WIPE=9 TO 13:LOCATE WIPE,1:PRINT SPACE$(78):NEXT
132Ø IF A4$="Y"THEN LOCATE 9,1:INPUT" WIDTH ";CX:LOCATE 9,4Ø:INPUT" LENGTH ";WX:
FOR DL=1 TO 6ØØ:NEXT
133Ø IF AN$="6" THEN 194Ø
134Ø LOCATE 9,1:PRINT STRING$(8Ø,"_");:LOCATE 1Ø,1:PRINT SPACE$(4Ø):LOCATE 1Ø,1:
PRINT" COST PER SQ. YARD";:INPUT YC:GOSUB 144Ø
135Ø PRINT" CARPETING CALCULATION:"
136Ø PRINT" YOU WILL NEED APPROX.";
137Ø CC=(WM*LM)+(AW*AL)+(BW*BL)-(CW*CL)-(CX*WX):YD=INT(CC/9)
138Ø PRINT YD;" SQ.YDS OF CARPET."
139Ø PRINT" YOUR COST WILL BE ABOUT...";:CS=YC*YD:PRINT USING"$#,#####,.##";CS:P
RINT" FOR  THE ";RM$
14ØØ COLOR 4:PRINT" PRINT THIS? <Y/N>":COLOR Ø
141Ø OG$=INKEY$:IF OG$=""THEN 141Ø
```

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```
142Ø IF OG$="Y"THEN GOSUB 232Ø
143Ø RUN 1ØØ
144Ø OUT &H38,5Ø
145Ø RETURN
146Ø OUT &H38,1
147Ø RETURN
148Ø BEEP
149Ø RETURN
15ØØ COLOR 1,3:CLS
151Ø PRINT STRING$(8Ø,"*"):SYMBOL(9Ø,8),"CONCRETE VOL.MEASURE",3,3,4
152Ø LOCATE 5,1:PRINT STRING$(8Ø,"*");
153Ø COLOR Ø
154Ø PRINT"FOR CONCRETE MEASUREMENT YOU CAN FIRST OBTAIN THE HEIGHT,WIDTH AND DE
PTH OF THE MAJOR PART OF THE PROJECT. THEN WE CAN 'ADD- ON' THE OTHER AREAS AS R
EQUIRED OR TAKE-OFF ."
155Ø COLOR 1
156Ø LINE(35Ø,12Ø)-(6ØØ,12Ø),1:LINE-(55Ø,14Ø),1:LINE-(3ØØ,14Ø),1:LINE-(35Ø,12Ø),
1
157Ø LINE-(35Ø,15Ø):LINE-(6ØØ,15Ø):LINE-(6ØØ,12Ø):LINE(6ØØ,15Ø)-(55Ø,17Ø):LINE-(
3ØØ,17Ø):LINE-(3ØØ,14Ø):LINE(3ØØ,17Ø)-(35Ø,15Ø):LINE(55Ø,17Ø)-(55Ø,14Ø)
158Ø PAINT(5ØØ,16Ø),1,1:PAINT(556,162),1,1
159Ø SYMBOL(38Ø,175),"Sample Concrete Pour",1,2,4
16ØØ W5$=CHR$(27)+"    LENGTH    "+CHR$(26):W6$=CHR$(27)+"HEIGHT"+CHR$(26)
161Ø SYMBOL(4ØØ,126),W5$,1,1,Ø
162Ø SYMBOL(29Ø,115),W6$,1,1,Ø,1
163Ø LINE(62Ø,155)-(57Ø,175),4:COLOR Ø:LOCATE 21,73:PRINT"WIDTH"
164Ø COLOR 4:LOCATE 9,1
165Ø PRINT" ENTER ALL MEASUREMENTS AS 'FEET'AND THEN REMAINING AS 'INCHES'."
```

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```
166Ø LOCATE 1Ø,1:COLOR 1:INPUT" WIDTH FT.";WF:LOCATE 1Ø,3Ø:INPUT"WIDTH + IN.";WI
167Ø LOCATE 11,1:INPUT" LENGTH FT.";LF:LOCATE 11,3Ø:INPUT"LENTH + IN.";LI
168Ø LOCATE 12,1:INPUT" HEIGHT(OR DEPTH) FT.";HF:LOCATE 12,3Ø:INPUT"HEIGHT + IN.
";HI
169Ø FOR WIPE=1Ø TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø):NEXT
17ØØ MSQ=((WF*12)+WI)*((LF*12)+LI)*((HF*12)+HI)
171Ø LOCATE 1Ø,1:INPUT" ANY ADD-ON AREAS (Y/N)";AO$
172Ø IF AO$="Y"THEN 186Ø ELSE 174Ø
173Ø FOR WIPE=1Ø TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø):NEXT
174Ø FOR WIPE=1Ø TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø):NEXT
175Ø LOCATE 1Ø,1:INPUT" ANY TAKE-OFF AREA'S (Y/N)";TU$
176Ø IF TU$="Y"THEN 19ØØ ELSE 177Ø
177Ø VCU=MSQ/46656!
178Ø FOR DL=1 TO 3ØØ:NEXT:FOR WIPE=1Ø TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø):NEXT:
LOCATE 1Ø,1
179Ø PRINT " TO COMPLETE PROJECT YOU WILL USE APPROXIMATLEY";:PRINT USING"#####,
.#";VCU;:PRINT" CU.YDS OF CONCRETE."
18ØØ PRINT" PRINT THIS? <Y/N>"
181Ø A$=INKEY$:IF A$=""THEN 181Ø
182Ø IF A$="Y"THEN GOSUB  241Ø
183Ø COLOR 4:PRINT"< Hit RETURN for menu >"
184Ø A$=INKEY$:IF A$="" THEN 184Ø
185Ø RUN 1ØØ
186Ø LOCATE 11,1:INPUT" WIDTH FT.";AW:LOCATE 11,3Ø:INPUT" WIDTH IN.";AK:LOCATE 1
2,1:INPUT" LENGTH FT.";AL:LOCATE 12,3Ø:INPUT" LENGTH IN.";AI:LOCATE 13,1:INPUT"
HEIGHT FT.";AH:LOCATE 13,3Ø:INPUT" HEIGHT IN.";AJ
187Ø ACU=((AW*12)+AK)*((AL*12)+AI)*((AH*12)+AJ)
188Ø MSQ=MSQ+ACU
```


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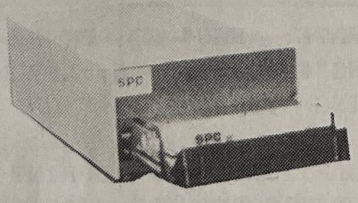

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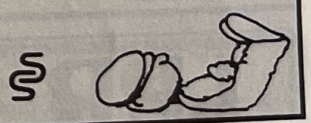
```
189Ø FOR DL=1 TO 5ØØ:NEXT:GOTO 174Ø
19ØØ LOCATE 11,1:INPUT" WIDTH FT.";TW:LOCATE 11,32:INPUT" WIDTH IN.";TX:LOCATE 1
2,1:INPUT" LENGTH FT.";TL:LOCATE 12,3Ø:INPUT" LENGTH IN.";TY:LOCATE 13,1:INPUT"
HEIGHT FT.";TH:LOCATE 13,3Ø:INPUT" HEIGHT IN.";TZ
191Ø TCU=((TW*12)+TX)*((TL*12)+TY)*((TH*12)+TZ)
192Ø MSQ=MSQ-TCU
193Ø GOTO 177Ø
194Ø FOR WIPE=7 TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø);:NEXT:LOCATE 7,1:PRINT" TIL
E  CALCULATIONS:"
195Ø PRINT" ARE YOU USING 9 OR 12 INCH TILES (9 or 12)";
196Ø INPUT TL$
197Ø IF TL$="9"OR TL$="12"THEN 198Ø ELSE 196Ø
198Ø TL=VAL(TL$)
199Ø GOSUB 2Ø6Ø:W4=INT(CW/TL):L4=INT(CL/TL):W5=INT(CX/TL):L5=INT(WX/TL)
2ØØØ TN=(W1*L1):IF A1$="Y" THEN TN=TN+(W2*L2):IF A2$="Y"THEN TN=TN+(W3*L3)
2Ø1Ø IF A3$="Y" THEN TN=TN-(W4*L4):IF A4$="Y"THEN TN=TN-(W5*L5)
2Ø2Ø PRINT" YOU WILL NEED ";INT(TN)+1;" TILES
2Ø3Ø COLOR 4:PRINT" PRINT THIS? (Y/N)":COLOR Ø
2Ø4Ø A$=INKEY$:IF A$=""THEN 2Ø4Ø
2Ø5Ø IF A$="Y" THEN 246Ø ELSE RUN 1ØØ
2Ø6Ø IF WM/TL<>INT(WM/TL)THEN W1=INT(WM/TL)+1 ELSE W1=WM/TL
2Ø7Ø IF LM/TL<>INT(LM/TL)THEN L1=INT(LM/TL)+1 ELSE L1=WM/TL
2Ø8Ø IF AW/TL<>INT(AW/TL)THEN W2=INT(AW/TL)+1 ELSE W2=AW/TL
2Ø9Ø IF AL/TL<>INT(AL/TL)THEN L2=INT(AL/TL)+1 ELSE L2=AL/TL
21ØØ IF BW/TL<>INT(BW/TL)THEN W3=INT(BW/TL)+1 ELSE W3=BW/TL
211Ø IF BL/TL<>INT(BL/TL)THEN L3=INT(BL/TL)+1 ELSE L3=BL/TL
212Ø RETURN
213Ø LPRINT STRING$(5,13):LPRINT TAB(5)STRING$(7Ø,"*"):LPRINT TAB(5)STRING$(7Ø,"
*"):LPRINT :LPRINT TAB(32)"SANYØ-HANDIMAN":LPRINT :LPRINT TAB(33)"JOB ESTIMATE"
214Ø LPRINT :FOR  ZV=1 TO 2:LPRINT TAB(5)STRING$(7Ø,"*"):NEXT
215Ø LPRINT :LPRINT :RETURN
216Ø 'REM PANEL PRINT
217Ø  GOSUB 213Ø
218Ø LPRINT TAB(2Ø)"PANELING CALCULATIONS:  "+RM$:LPRINT
219Ø GOSUB 252Ø
22ØØ LPRINT TAB(2Ø)"TOTAL SHEETS NEEDED:  ";:LPRINT USING "#####,.#";NP
221Ø RETURN
222Ø GOSUB 213Ø:LPRINT TAB(2Ø)"PAINTING CALCULATIONS:  "RM$:LPRINT
223Ø GOSUB 252Ø
224Ø LPRINT TAB(2Ø)"COST OF PAINT: "+"$"+CG$+" PER GALLON":LPRINT TAB(2Ø)"APPLYI
NG "+NC$+" COATS":IF A$="Y" THEN CO$="CEILING INCLUDED" ELSE CO$="CEILING NOT IN
CLUDED"
225Ø LPRINT TAB(2Ø)CO$:LPRINT TAB(2Ø)"SPREAD RATE: "FG$" SQ. FT PE GALLON":LPRIN
T :LPRINT TAB(2Ø)"YOU WILL NEED ";:LPRINT USING"#####,.#";GN;:LPRINT " GALLONS":
LPRINT TAB(2Ø)"APPROXIMATE COST: ";:LPRINT USING "$######,.##";CP
226Ø RETURN
227Ø GOSUB 213Ø:LPRINT TAB(2Ø)"WALLPAPER CALCULATION: "+RM$:LPRINT :IF SS$="Y" T
HEN S1$="SINGLE SIZE ROLL" ELSE IF SS$="N" THEN S1$="DOUBLE SIZE ROLLS"
228Ø LPRINT TAB(2Ø)S1$:LPRINT TAB(2Ø)"WALL HEIGHT:"HW" FEET":LPRINT TAB(2Ø)NW"WA
LLS "VAL(WA$)" FEET LONG":LPRINT TAB(2Ø)SB"WALLS "VAL(WB$)" FEET LONG"
229Ø LPRINT TAB(2Ø)NZ "WINDOWS":LPRINT TAB(2Ø)ND "DOORS":LPRINT TAB(2Ø)"COST PER
 ROLL: ";:LPRINT USING"$#####,.##";CR:LPRINT
23ØØ LPRINT TAB(2Ø)"YOU WILL NEED ";RO;" ROLLS":LPRINT TAB(2Ø)"YOUR COST: ";:LPR
INT USING"$#####,.##";CR*RO:LPRINT STRING$(5,13)
231Ø RETURN
232Ø GOSUB 213Ø:LPRINT TAB(2Ø)"CARPETING CALCULATION: "+RM$
233Ø LPRINT :LPRINT TAB(2Ø)"MAIN AREA "WM" BY "LM" FEET"
234Ø IF A1$<>"Y" THEN 236Ø
235Ø LPRINT TAB(2Ø)"ONE ADD-ON "AW" BY "AL" FEET":IF A2$="Y" THEN LPRINT TAB(2Ø)
```

```
"OTHER ADD-ONS "BW" BY "BL" FEET"
236Ø IF A3$<>"Y" THEN 238Ø
237Ø LPRINT TAB(2Ø)"ONE CUTOUT "CW" BY "CL" FEET":IF A4$="Y" THEN LPRINT TAB(2Ø)
"OTHER CUTOUTS "CX" BY "WX" FEET"
238Ø LPRINT TAB(2Ø)"COST PER SQ/YD";:LPRINT USING"$#####,.##";YC
239Ø LPRINT :LPRINT TAB(2Ø)"YOU WILL NEED"YD" SQUARE YARDS":LPRINT TAB(2Ø)"TOTAL
 COST: ";:LPRINT USING"$#,#####,.##";CS:LPRINT STRING$(5,13)
24ØØ RETURN
241Ø GOSUB 213Ø:LPRINT TAB(2Ø)"CONCRETE ESTIMATE":LPRINT :LPRINT TAB(2Ø)"*****MA
IN AREA*****":LPRINT :LPRINT TAB(2Ø)"WIDTH"WF" FEET"WI" INCHES":LPRINT TAB(2Ø)"L
ENGTH"LF" FEET"LI" INCHES":LPRINT TAB(2Ø)"DEPTH"HF" FEET"HI" INCHES":LPRINT
242Ø IF AO$="Y" THEN LPRINT TAB(2Ø)"*****ADD-ONS*****":LPRINT :LPRINT TAB(2Ø)"WI
DTH"AW" FEET"AK" INCHES":LPRINT TAB(2Ø)"LENGTH"AL" FEET"AI" INCHES":LPRINT TAB(2
Ø)"DEPTH"AH" FEET"AJ" INCHES":LPRINT
243Ø IF TU$="Y" THEN LPRINT TAB(2Ø)"******CUTOUTS*****":LPRINT :LPRINT TAB(2Ø)"W
IDTH"TW" FEET"TX" INCHES":LPRINT TAB(2Ø)"LENGTH"TL" FEET"TY" INCHES":LPRINT TAB(
2Ø)"DEPTH"TH" FEET"TZ" INCHES":LPRINT
244Ø LPRINT TAB(2Ø)"TOTAL CUBIC YARDS REQUIRED: ";:LPRINT USING"#####,.##";VCU
245Ø GOTO 183Ø
246Ø GOSUB 213Ø:LPRINT TAB(2Ø)"FLOOR TILE CALCULATIONS: "+RM$:LPRINT
247Ø LPRINT TAB(2Ø)"MAIN AREA "WM"BY "LM"INCHES"
248Ø IF A1$="Y" THEN LPRINT TAB(2Ø)"ONE ADD-ON"AW" BY"AL" INCHES":IF A2$="Y"THEN
 LPRINT TAB(2Ø)"OTHER ADD-ONS"BW" BY"BL" INCHES"
249Ø IF A3$="Y" THEN LPRINT TAB(2Ø)"ONE CUTOUT"CW" BY "CL" INCHES":IF A4$="Y" TH
EN LPRINT TAB(2Ø)"OTHER CUTOUTS"CX" BY"WX" INCHES"
25ØØ LPRINT TAB(2Ø)"BY USING"TL" INCH TILES-":LPRINT TAB(2Ø)"YOU WILL NEED ";INT
(TN+1);" TILES"
251Ø INPUT " HIT <ENTER> FOR MENU";PE:RUN 1ØØ
252Ø LPRINT TAB(2Ø)"WALL HEIGHT: "+HA$+" FEET "+HB$+" INCHES ":LPRINT TAB(2Ø) AZ
;:LPRINT" WALLS "+WF$+" FEET "+WI$+" INCHES ":LPRINT TAB(2Ø) AX;:LPRINT" WALLS "
+WG$+" FEET "+WJ$+" INCHES "
253Ø LPRINT TAB(2Ø)WN" REGULAR WINDOWS":LPRINT TAB(2Ø)OQ" PICTURE WINDOWS":LPRIN
T TAB(2Ø)DR" DOORS"
254Ø LPRINT :RETURN
```



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Q. *As a lawyer I would like to use the paragraph (¶) and section (§) symbols that are a part of the character set in my Toshiba 1350 printer. I have tried all kinds of things with* INSTALL *and have not gotten satisfactory results. What should I do?*

Terry McCall
New Orleans, LA

A. Please follow the original article in SOFT SECTOR (August '84, Page 55) and INSTALL the following two user-defined functions as shown below:

1) Make a backup copy of *WordStar* with INSTALL.
2) Run the INSTALL program.
3) Proceed to the Installation Menu.
4) Select 'D' from the Installation Menu.
5) You will now be at the Printer Installation Menu.
6) Press 'O' for user-defined functions.
7) The first one is function ^PQ.
8) Press 'C' to change, then when asked for the value to enter, use ",A9"; now follow the article instructions.
9) The second function will be ^PW.
10) Press 'C' to change, then when asked for the value to enter, use ",AF"; now follow the article instructions.
11) This will complete the modifications, but you must follow the article to exit properly and save the changes.

The paragraph symbol (¶) will now be printed at every point in text that you use ^PW, and the section symbol (§) will print at each use of ^PQ. Your screen will show ^PW or ^PQ in the body of your text.

Q. *MicroPro was having a promotion where they were giving away free, tutorial disks for* WordStar *and* CorrectStar *if you bought the original programs. How can a Sanyo MBC-550 owner get these? Also, where can I get tutorials on the other MicroPro products that came with the machine?*

Robert Waterstone
Marietta, GA

A. The tutorial disks that MicroPro was giving away were an incentive to purchase the software from a retail dealer and are not available. They would only run on a true IBM PC clone, which the Sanyo is not.

CorrectStar presently does not run on the Sanyo as it is distributed. But there is a patch to the IBM PC version which will allow it to function correctly on the MBC-555-2. [*Editor's Note: See the January '85 issue, Page 6.*]

Regarding a tutorial for *WordStar*, you already have a very good one in the training guide that was shipped with the computer. If this is not what you need, I would suggest *Introduction to WordStar*, by Arthur Naiman and published by SYBEX, ISBN 0-89588-134-9. This book is available in most book stores that carry computer books and magazines.

As for *InfoStar*, you should purchase (from your Sanyo dealer) the *ReportStar Reference Manual*. This is a must if you really want to be able to use *InfoStar*. *InfoStar* is the name given to the package consisting of *DataStar* and *ReportStar*, but can be considered one program rather than two. *MailMerge* and *SpellStar* are documented in the book by Naiman, mentioned above.

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CalcStar is covered quite well in the manual that came with the computer. I am sure if you take each of the manuals and *do* the examples as shown you will be satisfied with the results. As with all sophisticated software, it is a must to read the book first, not after you start and cannot figure out what to do next.

Q. *I have a Comrex CR-II and would like to get the following features but have not been able to get them because the manual is so poorly written. I need boldface, double strike, underlining, super- and subscript and compressed type.*

Sue Bastian
Athens, GA

A. Regarding the installation of your Comrex CR-II printer, if you will follow the article on INSTALL mentioned above, and select "Diablo-Xerox 1610/1620," you should have all of the features that *WordStar* is capable of and all that you mentioned. This choice will be one of those from the Standard Printer Menu.

This will also hold true for the "sister" printers to the Comrex — the Brother HR-15 and the Dynax 15.

Q. *I have 256K of memory in my Sanyo MBC-555-2. Can I increase the size of the document that I can edit in memory when using* EasyWriter I?

Robert Warren
El Paso, TX

A. If you have an MBC-555-2 with 256K of RAM and *Easy Writer I* does not take advantage of the memory, I do not know of a way to change this situation. I have gone over the documentation and I.U.S. seems to avoid this question totally. I cannot find any reference to file size; they skip around this question more ways than I could ever think of.

If you need large size files, I would suggest using *WordStar*, as it is disk dependent rather than memory dependent; that is, you can have one file the size of your entire data disk.

Q. *I have written an invoicing system that reads daily time-use records and a client data file. It then prepares invoices in a form ready to be mailed. However, some of the invoices need additional information specific to the invoice. To allow for such, the entire report* .PRN *file must be written to disk where editing can be done under* WordStar.

My problem is that the .PRN *file has all of the reviewed time records written in it as non-printing (.) lines. This represents a real mess when editing the file.*

Is there some way that I can eliminate the period lines from being written to the .PRN *file?*

Charlie Wegman
Raleigh, NC

A. There does not appear to be a way to keep the period lines from being written to the .PRN file. You did not give me a clue as to the nature or quantity of information you are adding to your invoices. I would suggest you consider

(The authors, Charlotte and Brian Stone, have been involved with computers since their purchase of the original Radio Shack Model I in July of 1978. Since April, 1984, Charlotte has been using the Sanyo in her daily work routine as office manager for a Detroit firm. Brian has been using a variety of Sanyos since May of 1983. Of the five computer systems they presently own, two are Sanyos.)

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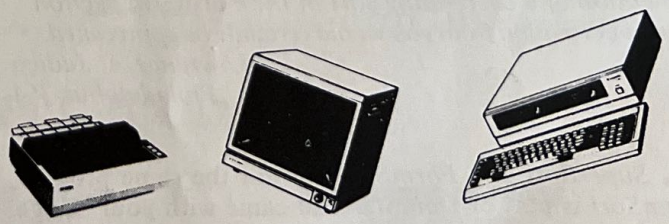

adding a field to your report that could hold this extra information and define the field to print only when it contains information.

Set up a separate data file for this additional information and use it as a reference data file for your report rather than accessing it sequentially. Make sure you include a key field in the reference file that will match a unique entry in your time-use records or client data file. That will let your report know when to draw in the additional info.

Q. *I use my Sanyo MBC-550 and* CalcStar *to compute monthly sales tax obligations for a retail store. My goal is to develop a* CalcStar *worksheet which has embedded functions and will enable me to plug in some values, do a recalculation, and the output would be that month's tax entry. Unfortunately, whenever I have a value which is the product of a function (such as sales times four percent) and I use the* `+SUM` *command to add a column, the chances are pretty good that the sum will be off by one cent.*

I assume this is due to a rounding problem and I have tried going to three decimal places as a solution, but that didn't work either. The spreadsheet seems to remember a different value than what it shows in the cell. Do you know a way around this problem?

J.W. Mumma, Jr.
East Detroit, MI

A. Unfortunately, I have not found a solution to your problem with *CalcStar*. *CalcStar* does not round off; it truncates at the decimal precision you set for the cell. That is, it truncates the screen display at the precision you set. Internally (in memory), *CalcStar* is accurate to 14 places. The 14 places are a total of places both before and after the decimal. Eight digits before the decimal will leave six places after the decimal. There is no way to eliminate these hidden digits. The usual practice of adding .005 to the result of a formula to force a round off may appear to work on a cell set to a two decimal place precision, but in fact, this only causes inaccuracy because of the digits carried off the screen.

Suppose a cell shows a sales tax entry as 1.43, resulting from the calculation of four percent of 35.86. As a test, reformat the decimal precision of the cell to four. The cell would now display 1.4344. Adding .005 [as in (4%35.86)+.005] would result in 1.4394 which, correctly, would not round up. However, there is no way to drop the final two digits. Both the final 44 on the one hand or the final 94 on the other will remain and will be added in any *SUM* function. This explains the reason for the problem you are having, but does not offer a solution.

Q. *Page E-3 of the* DataStar Training Guide *states that* SuperSort *can arrange numeric data in ascending or descending order. The problem is with the descending sort: I've tried every possible combination with no success. I also purchased the* ReportStar *user manual. There was no mention of a descending sort in the* FormSort *section.*

Any information from you would certainly be appreciated.

Lawrence A. Jadico
Philadelphia, PA

A. *SuperSort* and *FormSort* are not the same product. *FormSort* is part of *DataStar* and came with your Sanyo. It is very limited in function compared to *SuperSort* and will not do a descending sort.

SuperSort, by *MicroPro*, is a separate product. It can sort and/or merge almost any kind of data, not just data produced by *DataStar*. It does not need to refer to definition files to interpret the data it sorts. In short, it is very versatile. At this time, MicroPro does not offer a version for MS-DOS, just for CP/M and PC-DOS. The PC-DOS version may or may not run on the Sanyo. If your dealer has a demo copy, try before you buy!

Q. *[I would like] an explanation of how to log Drive B: on* InfoStar *so that all data and reports would be automatically located there. This would eliminate the need to continually tell the program where to find this information. Also, when* ReportStar *is added on the same floppy disk with* FormGen *and* DataStar, *there isn't enough room to load the report or data.*

John E. Korpela
Great Falls, MT

A. There is no way to change the logged drive once you are in *InfoStar*. Put the command files and overlays on your 'A' disk. Keep all definition files, data files and index files on the 'B' disk. Log onto drive B: before invoking *InfoStar*. Then use the command `A:DATASTAR B:filename` to enter the program. This would work for *ReportStar* also. It would not really be necessary to do this for *ReportStar* though, because if you have the *ReportStar* command and overlay files on A: and your report definition files and data files on B:, you can invoke the program with the command `REPORT B:filename`. If you have defined the location of the data file as 'B' in the file description portion of your report definition file, there will be no location prompts.

Q. *I have had two problems with* DataStar *that have caused me some problems and I'm hoping you can help. The first concerns encountering a power failure while entering data on a form. After power was restored and I tried to enter the* DataStar *file again I got the message "File has not been properly terminated." Is there any way of getting back into a file when something like this happens?*

My second problem arose when I again was entering DataStar. *Two messages asked on which drive do you want the data file and on which drive do you want the index file. All these require, are the letters for the appropriate drive. The follow-up action is instantaneous. Herein lies the problem. There is no chance to correct an error at this critical point. As happened with me on one occasion, I slipped from the 'B' key and hit the 'N' key right next door. The results were disastrous! Not only did my data file on Drive B: get erased, but part of the program disk in Drive A: was erased as well. When I tried to enter* DataStar *again, the message that asks for the drive for data did not appear. I had to rebuild my program disk.*

Is there any way that the program can be altered to require the use of `RETURN` *after these two prompts?*

Bob Bleier
Palm Bay, FL

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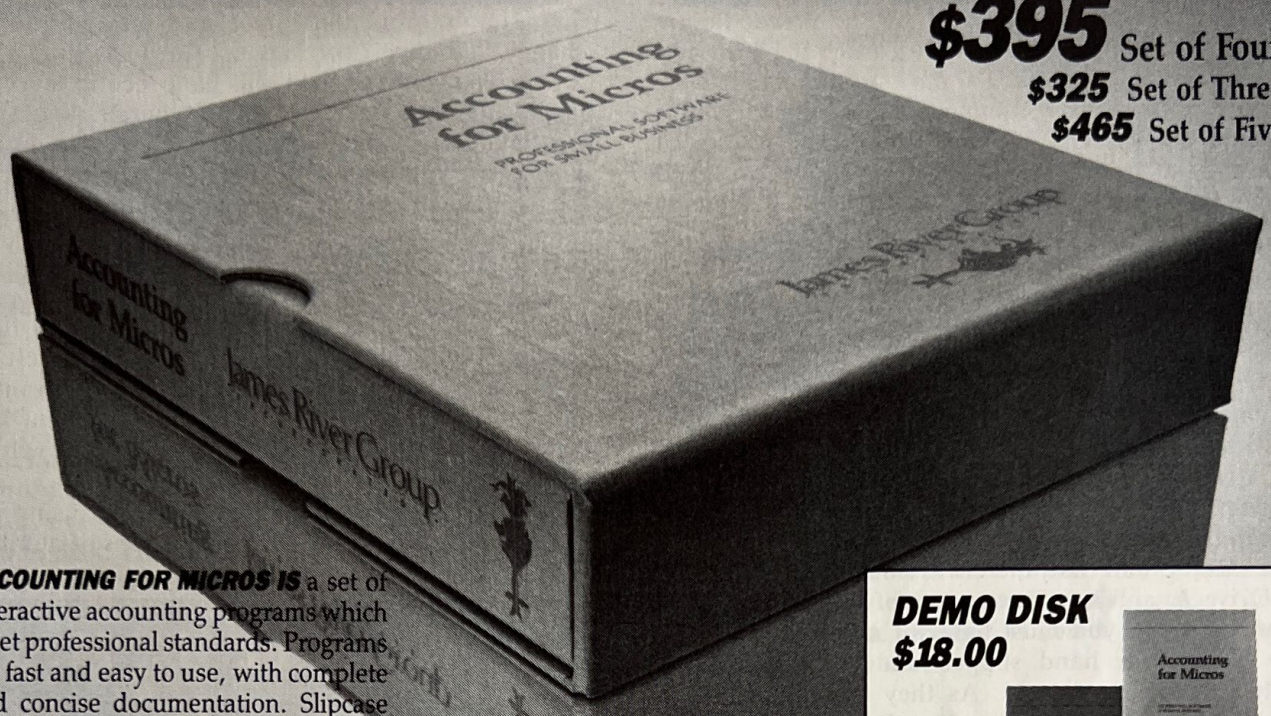

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A. Brian and I spent considerable time trying to duplicate the problems you wrote about. To begin, we simulated a power failure. After rebooting the computer, we were able to enter our *DataStar* file without getting the "not properly terminated" message. However, all of the data from the entry session interrupted by the power failure was gone. This emphasizes a lesson I learned the hard way early in my computer career — *back up data files after every entry session.* I also recommend intermediate backups during long entry sessions, determining the spacing of backups by the length of time I can afford to spend reentering the same data if I should lose it. Personally I don't want to repeat anything longer than a half hour's worth.

Now, how about the message you received when you could not reenter your datafile? MicroPro says not all users have this problem, but if you do, the remedy is to patch *FormSort* using DEBUG and then re-sort the data file with the patched *FormSort*. Patch FORMSORT.OVR at location 099Eh with a new value of 10h.

Next I tried hitting the 'N' key when *DataStar* asked for the drive for a data file. I did not get an error message of any kind. In fact, *DataStar* opened a new data file on Drive A:. Other than that, there was no effect to any other file on Drive A: and no effect to any of the files on Drive B:. I conclude that you must have hit more than just the 'N' key when your hand slipped and the combination probably can't be duplicated. As they say, "You had to be there." There is no way to alter *DataStar* to require hitting RETURN after these prompts, so just try to be careful.

Q. *After the form has been created and the system chained (in* DataStar*), how does one add an additional key field to those previously designated?*

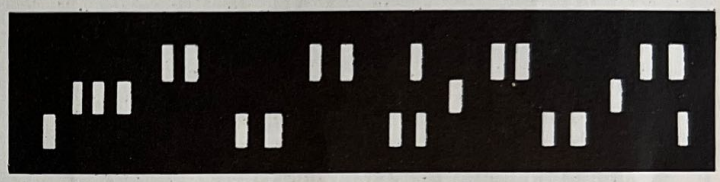
Also, is there any way to use a proportional print wheel to print columns that will line up? The .UJ *command has no effect on my Qume 20 printer. Is there something I forgot to do in* INSTALL *or is this just something I have to live with?*

Walter E. Mather
Virginia Beach, VA

A. Since you do not say so, I am assuming that you want to make an existing field into a key field. From the system prompt, use *FormGen* and the filename to reenter the definition file. If you have one key field now and want to change another field into a key field secondary to the first, simply move the cursor into the field you want to change and type CONTROL-K. The field line will change to asterisks and the field will be a second level key field. If the first key field was a "last name" and the second key field was a "first name," then sorting the data file with *FormSort* would alphabetize by last name and also sort the first names for each identical last name into alphabetical order.

If you have a need to change the sort level around among several key fields, it is best to first go through the definition file and use CONTROL-K to toggle off the key field status of all the fields. When there are no key fields left, carefully toggle them back on in the exact order you want the data sorted. To double check the different levels of key fields, print a listing with CONTROL-W. Each key will show its numerical level.

Regarding your second question about using a proportional wheel with *WordStar* and columns of numbers. First



of all, *WordStar* does not support proportional spacing (it uses micro-justification). I use *WordStar* to do quotations which are a mix of text and columns of numbers and it works fine with a daisy wheel printer. You may not be using the .UJ command properly if the example in your question is complete. The .UJ command is a "switch" — it turns micro-justification *on* and *off*. To turn it on (the default), use .UJ1 and to turn it off use .UJ0. This is probably what is needed to correct your

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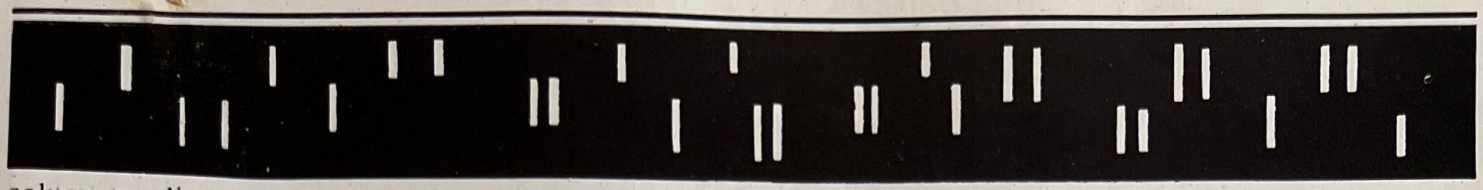


columnar alignment problem if you have installed *WordStar* for a Qume 20 printer.

Q. *I am experiencing a great deal of difficulty in using the* CalcStar *program supplied with my Sanyo 555-2. When I continue a spreadsheet to about 38 rows, a "Memory Low" signal appears, then a signal stating "Memory Too Low To Complete Command." I've followed the manual to no avail. Is the problem in the computer, system disk or* CalcStar *program? What can I do to resolve this problem?*

Henry Herman
Woodstock, GA

A. *CalcStar* is a memory resident program. Once loaded into memory from your disk, all of the information and calculations are stored and handled in memory until you save them to disk. The manual Sanyo supplies for *CalcStar* was originally written for their CP/M machines. Ordinarily this is not a problem. Except for a few references to prompts used by CP/M machines, as in the instructions for backing up your master disks, the programs run the same once you are into them no matter which operating system you have.

However, the manual states: "Up to 481 cells are available in a system with 64K memory." This statement refers to a machine using CP/M. Unfortunately, MS-DOS uses more of your machine's memory, leaving less for *CalcStar*. The only remedy is to expand this memory. Visit your dealer for a quote on having more memory installed. *CalcStar* will address the extra memory with no problem at all.

Q. *How can the default disk be changed in* CalcStar*? That capability is in* WordStar *and should be in* CalcStar*, but I can't figure it out.*

J. Bartlett

A. *CalcStar* is different from *WordStar* in that after you have loaded the program, you are working in the memory of your computer and not using the disk as an extension of memory. Therefore, it is not necessary to change the logged disk. You may save to and load files from an alternate disk drive by designating the drive as part of the filename. For example, to load a spreadsheet saved on the B: drive, on the opening *CalcStar* screen, type ";L" and then *B:filename*.

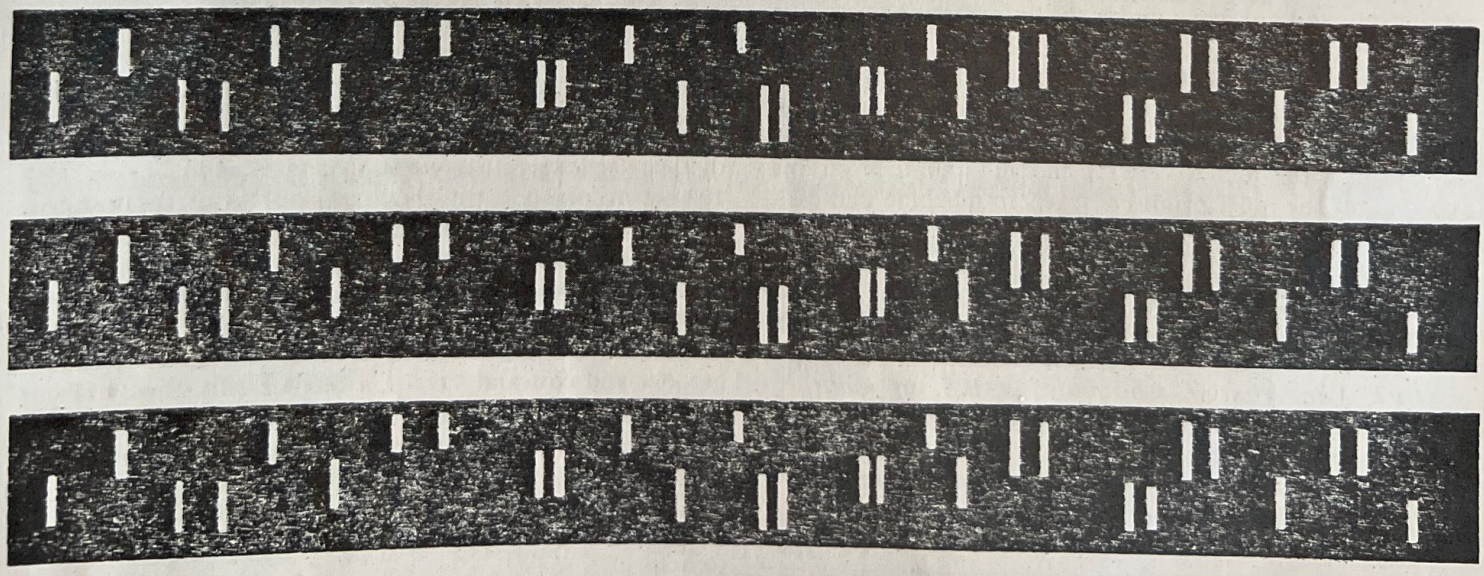
Note: This letter did not receive a personal reply because the address was not included on the letter. Envelopes do get separated from letters, so to avoid having to wait for your letter to be published, please put your return address on your letter.

Q. *I have used* InfoStar *for saving quotations from my readings and then sorted them on the key field using* FormSort. *I presently have about 90K of data and I am concerned about running out of disk space. Can this be broken up, say A, through M and N through Z, with each group on its own disk?*

Bill Branham, Pastor
Reinbeck IA

A. The easiest way to divide your data in half would be to use *WordStar*. First, make two complete backups of your data file. Load the file into *WordStar* with the 'N' command (non-document) and pick your separation point. Then do a block delete of half of the file. Do the same thing with the second copy, but delete the opposite half. You will now have two new copies of your data, each containing half of the original file.

It will be necessary to use *FormSort* to create a new index for each of the smaller files. Once this is done, you will be able to use the files just as before.



When your Sanyo has locked up and it seems like the end of the road for that text file, it's . . .

Debug To The Rescue

By Richard C. Vanderburgh

Assembly/machine language programming scares most people enough to avoid it like the plague, partly because some of the concepts are difficult to grasp, but perhaps most importantly because of a lack of motivation. If you are a typical Sanyo 550/555 user, you run word processors and spreadsheets a lot, and maybe write a few programs in BASIC. So why bother with machine language? (From here on I'll use the phrase machine language to mean either assembly, which is somewhat English-like, or machine, which is machine-readable zeros and ones.)

Anyone who has typed in a lot of text, sooner or later experiences that horror of horrors: machine hangup. Nothing works, so you write off all that time and effort with a Reset and start over from scratch. Well, I'm going to show you how you may be able to recover most or all of that text even after a system Reset. For this exercise you won't need to learn any machine language instructions, but you will be introduced to some machine language concepts and the use of a powerful utility called DEBUG.

I say *may* be able to recover, since it all depends on where the applications program you are using puts the text you are typing in, and how much memory your system has. It turns out that with my 128K 550 system, following a Reset, memory at absolute locations between 10000 and 18E7F Hex remains as it was before the Reset. This means that any text I have created that is stored in this region of memory is still there after the Reset. Fortunately, *Easy Writer* stores file text starting at absolute location 106FE, making it possible to recover up to 8780 Hex, or 34,688 base 10 characters. BASIC starts program load at absolute location 12554, providing up to 692B Hex, or 26,923 bytes of protected storage.

This is all well and good you say, but how did I find all this out, and how can you use this information to recover otherwise lost text?

Well, the answer to both questions is by using DEBUG. This is a machine language program which comes with MS-DOS, effectively providing a Sanyo user with a good set of tools with which to observe and manipulate programs and data at the most primitive levels in machine and disk memories. If Sanyo hasn't published a DEBUG user's guide by the time you read this article, you may find it worth the expense to buy IBM's disk operating system manual (it also covers the new DOS features of Sanyo MS-DOS 2.11). In any case, you won't need any extra material to apply DEBUG to the example below.

What you are going to do is to set things up so that right in the middle of a text creation session with *Easy Writer*, you will simulate a system hangup by pressing the Reset button, then go through the steps necessary to recover the text and put it into an *Easy Writer*-readable file. First, you will need to prepare a file called WOW.EZF by copying an existing .EZF file to that name. The existing file needs to be at least as long as the test file you are going to create. It won't hurt to use the longest .EZF file you have.

With WOW.EZF established on a known disk, invoke *Easy Writer* in the usual way and begin creating a test file with a few familiar lines from a book, poem, or whatever you like that you will later recognize. With a DOS 2.11 disk in the A: drive, press the Reset button. At the A> prompt, type DEBUG and hit ENTER.

At the '-' prompt, type D48BE and hit ENTER. This should display the contents of memory beginning at local location 48BE. If your machine is configured like mine, you should see the beginning of your "lost" text in the right hand column. If it is not there, DEBUG can help you search for the first few characters of your text. Type S0 FFFE "<string>" and ENTER. If the string occurs anywhere in the specified range (0 to FFFE in this case), the location will be displayed. In any case, make note of this address and the address of the last character of the test text for future use. Addresses have two parts: segment and offset, separated by a colon. For now, disregard the segment part. If you are not familiar with ASCII or Hex stuff, don't worry about locating the exact end address — just overestimate it.

Now you are ready to load the WOW.EZF file. Put the disk containing it into drive A: and issue the following commands to DEBUG:

```
N WOW.EZF          ENTER
L                  ENTER
```

You can check to see if WOW got loaded properly by entering D100. Now you are going to replace the first part of the WOW text with your test text: M<addr1> <addr2> 100 where <addr1> is the start address of the test text and <addr2> the end address. You may confirm this data move with D100. Save the modified WOW with W. You are now finished with this DEBUG session and may exit to DOS with Q followed by ENTER.

Now all that remains to be done is to invoke *Easy Writer*, get WOW and edit and save it. I include edit since you will find that in a real situation there would be remnants of the original WOW text remaining after the end of the recovered text, which you presumably would want to delete.

That's all there is to it! If you encountered insurmountable problems, write to me at SOFT SECTOR and I'll do my best to help.

(Dick Vanderburgh, who holds a B.S. in math/computers, is a VAX system manager in a radar signal processing lab. He is the author of a book, VisiCalc ViviSected, *an analysis and commented disassembly of the* VisiCalc *spreadsheet program, and of numerous magazine articles about computers.)*

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STRINGS AND STRING HAN

Previous articles in this series have just scratched the surface of what is available with Sanyo BASIC. This article will get into some real-world applications, since we'll be covering "strings," "string handling," and the common (and some uncommon) mathematical functions in Sanyo BASIC.

Strings

A "string" in BASIC is any combination of characters. Normally, numbers alone are not considered a string, but there are times they can be treated as strings, as you'll see.

A string is sometimes referred to as an "alphanumeric expression," while numbers alone are sometimes called a "numeric expression." Don't let this computer jargon confuse you. "Alpha" means letters (or punctuation or symbols), and "numeric" means numbers. "Characters" means any combination of dots.

Sometimes characters are called "icons," which represent small real-world items (like a telephone, typewriter, file cabinet, disk, computer and such) or "sprites," which tend to mean larger objects (like boats, airplanes, clouds, cars, people — generally movable objects). Unfortunately, these expressions are new and are often interpreted differently by users, so meanings vary in actual use.

One way to distinguish a string in a BASIC program is that it is enclosed in quotation marks. "This is a string" is a string. So is "28%," since it includes a percent sign, which is not a number. Sanyo BASIC is not as fussy as many computers about using a closing quotation mark around strings, but in some uses it's required, so get into the habit of using both an opening and closing quote around strings.

String Variables

"Literal strings" are expressions to be used exactly as typed — such as those in the *Fortune Teller* program in the November '84 issue of SOFT SECTOR (Page 30).

However, just as you can have "numeric variables" (which may use alpha characters as the variable, such as X=2 or Y=5+15, and are sometimes called "simple variables"), you can have "string variables." These are identified by the dollar sign ($) following the variable name, such as VAR$, usually vocalized as "VAR string" or "VAR dollar sign." Bear in mind that your Sanyo doesn't care if you use an upper- or lowercase designation for the letters. If you use a lowercase letter, the computer changes it to uppercase (unless it is a literal string enclosed in quotes).

A variable name must start with an alpha character, and only the first 16 characters are valid — all beyond that are ignored. Also, you must be sure not to use a "reserved word" (keyword) as the variable itself, although the variable may include keywords. For example, PRINT cannot be used as a variable, but PRINTER can. Also, don't use punctuation within a keyword. PERCENT.TAX is okay in IBM PC BASIC, but not acceptable in Sanyo BASIC.

As with any rule, there are exceptions. You cannot use any variable name starting with FN or USR.

Defining Strings With DEFSTR

The command DEFSTR can assign variables beginning with any letter from 'A' through 'Z' to automatically be a string. This should be used carefully and near the beginning of a program. For example, DEFSTR A,B,C means all variables thereafter starting with A or B or C will be string variables rather than numeric variables. DEFSTR A-F will force all variables starting with the letters A, B, C, D, E, or F to be string variables.

While this can save you typing the string symbol ($) over and over when writing a program, it can also cause great confusion at a later date when you try to figure out the program. My advice: Don't use it!

Stringing Along

If you let A$=''Harry Jones'', any time you want ''Harry Jones'', just use A$. Be sure you use quotation marks

DLING

By Fred Blechman
Soft Sector Contributing Editor

before and after the string assignment, although they will not appear on the screen or printer when you call for that string.

As usual, a simple example is worth hundreds of words. Type in Listing 1 and then RUN it.

The screen clears and displays a "menu" of choices — just like a restaurant menu, from which the term is derived.

If you try to respond to the "Select number . . ." request by typing in a zero, or any number over five, Line 220 traps this error and asks again.

You should be able to follow this program with little explanation — which shows how much you've learned about BASIC already. Lines 10 through 40 make the string assignments used as variables in lines 400 through 800. Lines 100 to 200 clear the screen, print the menu, and skip two screen lines for the Line 210 INPUT prompt. Line 300, looking at the value of N assigned by your INPUT, jumps to the appropriate line, as explained in the last article in the discussion of ON/GOTO (Nov. '84, Page 27). The literal strings in lines 400 to 800 appear before the string variable, showing how you can mix the two. The GOTO 1000 in lines 400 to 700 jump the program around the unused lines. Line 800 doesn't need this GOTO since the next line is 1000.

Line 1000 introduces a courteous way to either repeat a program or escape. If you respond to the question with an upper- or lowercase 'Y', then Line 1010 recognizes this as R$ and loops back to the menu again. If you enter anything but a 'Y', the program continues through the friendly sign off.

String Dissection

Sanyo BASIC provides conventional BASIC commands for pulling characters out of strings. The LEFT$, RIGHT$, and MID$ statements are used to extract specific characters from a string. INSTR locates the position of a substring within a string. You do need to watch your syntax. Here are some examples, using A$="1234567890":

LEFT$(A$,5) will give you the first five characters in A$ — "12345" (without the quotes).

RIGHT$(A$,5) will give you the last five characters in A$ — "67890" (without the quotes).

MID$(A$,3,4) will give you four characters in A$, starting with the third character from the left — "3456" (without the quotes).

INSTR(4,A$,"789") gives you a number representing the position of the first matched character of the substring "789" in A$.

The number result here in the last example is 7. The 4 (which is optional) is the starting point of the search, but the result is the number of positions from the beginning (left side) of the searched string. If no number is used, the search starts at the first character in the searched string.

The INSTR function is not used frequently by beginning programmers. But the others are, and Listing 2 is an example of how a string (in this case, the internally held DATE$) can be dissected by the LEFT$, MID$ and RIGHT$ statements, and then reassembled in another form.

When you "boot up" the Sanyo in MS-DOS, you are asked for the date and time. If you enter them, they are kept in memory (although on my 550 the time runs about seven minutes an hour too fast!). When you get into BASIC, you can request the time with PRINT TIME$ and the date with PRINT DATE$. You can specify DATE$="MM/DD/YY" or TIME$="HH:MM:SS" (with the quotes and punctuation as shown) anytime you're in BASIC.

The DATE$ is displayed in an MM-DD-19YY format (only good until the year 2000). Listing 2 converts this to a more conventional readout with the month spelled out.

The program is very straightforward. Lines 20, 30 and 40 pull parts of the string from DATE$ and assign them to string variables A$, B$ and C$. Lines 100 to 210 perform a simple comparison search (more on that later) and then

reassign A$. Line 300 PRINTs the results, spelling out the month and adding a comma after the day. There are more elegant ways to do this in BASIC, but this is easy to follow.

MID$ Manipulation

There's a rare form of MID$ used to intermingle two strings. MID$(A$,5,3)=B$ would take the first three characters from B$ and replace three characters in A$, starting with the fifth character in A$. B$ is unaffected. Type and ENTER Listing 3 as an example.

When you RUN this, you'll find that "abc" replaces "567" in A$ and B$ has not changed.

String Concatenation

Strings can be "concatenated" (linked) together. That is, one string can be placed immediately following another string to form a new string. If A$=''Simple'' and B$=''Simon'', then A$+B$ =''SimpleSimon.'' If you wanted to put a space between the words ''Simple'' and ''Simon'', you could either add a space to the ''Simple '' or '' Simon'' string, or use the expression A$+'' ''+B$. You can even add CHR$(number) if you like, such as A$+CHR$(3)+B$, which results in the new string Simple(heart symbol) Simon.

Type and ENTER Listing 4. Be sure to put spaces before and after "my" and after "I." RUN and see how the strings and heart symbols are exactly where you want them.

String LENgth

This is really easy for a change. The LEN statement returns the LENgth of a string. For example, if A$=''Los Angeles'', then LEN(A$) equals 11. Notice that this includes the space between Los and Angeles, since a blank space within a string is also a character.

String to Numbers and *Vice Versa*

It is quite common in programming to sometimes treat numbers with string manipulation techniques, or to take numbers from strings and perform numerical operations on them. The VAL and STR$ functions take care of this. STR$(1234) makes 1234 a string that can then be manipulated (LEFT$, RIGHT$, etc.). Similarly, VAL(A$) converts the leading digits in a string to a numerical value. Listing 5 illustrates the use of STR$ and VAL.

When you RUN this, you'll see these numbers, all with a space (for a sign) ahead of each number:

```
 8469
 123 456 7890
 7654
```

As is usually the case when dealing with numbers, you can use "expressions" (calculated values). Change Line 30 as follows and then RUN again:

```
30 A$=STR$(A+2):B$=STR$(B*4):
C$=STR$(C/10)
```

This time the calculations within each set of parentheses (add two to 'A', multiply 'B' by four and divide 'C' by 10) was performed before each string conversion and the second printed line now reads:

```
 125 1824 789
```

CHR$ And ASC

CHR$ is simply a means of specifying any character of the possible 256 (numbers zero to 255) that can be called from the character set. Some computers allow you to conveniently design your own characters in BASIC; the Sanyo 550/555 does not.

By simply putting a number from zero to 255 within the parentheses after CHR$, you specify a character. As you've seen in this article already, CHR$(3), as an example, is a heart symbol.

The character set of the Sanyo is very consistent with the 91 common ASCII (American Standard Code for Information Interchange — pronounced "ask-key") codes for the alpha, numeric and punctuation characters (from CHR$(32) to CHR$(122)).

To determine the ASCII code number for any character, the ASC statement is used. If you type PRINT ASC(''A'') and press ENTER, the decimal number 65 appears. But if you type PRINT

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NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

—OPTIONAL—

1. YOUR PRESENT SYSTEM'S MEMORY:
   ☐ 128K ☐ 256K
   ☐ 192K ☐ 512K
2. YOUR PRESENT DRIVES:
   ☐ one single sided, double density
   ☐ two single sided, double density
   ☐ one double sided, double density
   ☐ two double sided, double density
   ☐ one 80 track drive
   ☐ two 80 track drives
   ☐ hard disk
3. YOUR PRESENT MONITOR:
   ☐ Monochrome ☐ RGB
   ☐ Other _____ ☐ Model _____
4. YOUR PRESENT PRINTER:
   ☐ Dot matrix ☐ Daisy wheel
   ☐ Laser ☐ Color
   ☐ Other _____ ☐ Model _____
5. WHICH OPERATING SYSTEM DO YOU USE MOST:
   ☐ MS-DOS 1.25 ☐ MS-DOS 2.11
   ☐ DS-DOS Ver._____ ☐ A-OK DOS Ver._____
   ☐ Greywolf ☐ Thoughtworks
   ☐ CP/M emulator ☐ Other _____
6. DO YOU HAVE AN RS-232 BOARD:
   ☐ Yes ☐ No
7. DO YOU OWN A MODEM:
   ☐ Yes ☐ No
   ☐ Brand _____
8. DO YOU SUBSCRIBE TO A MAJOR INFORMATION OR ELECTRONIC MAIL NETWORK:
   ☐ CompuServe ☐ Dow Jones
   ☐ MCI Mail ☐ The Source
   ☐ Western Union EasyLink ☐ Other _____
9. SOFTWARE I AM MOST LIKELY TO BUY:
   ☐ Arcade-type games ☐ Adventure games
   ☐ Business applications ☐ Art and/or graphics
   ☐ Home applications ☐ Music
   ☐ Utilities ☐ Word processing
   ☐ Terminal programs ☐ Educational programs
10. I AM MOST INTERESTED IN ACQUIRING:
    ☐ More memory ☐ Disk drives
    ☐ Hard disk ☐ Joysticks
    ☐ Video RAM board ☐ RS-232 board
    ☐ Modem ☐ Printer
    ☐ Expansion chasis ☐ Monitor
    ☐ CP/M emulator ☐ Books and manuals
    ☐ Alternate operating system
    ☐ Speech or sound synthesizer
11. I RATE SOFT SECTOR:
    ☐ Excellent ☐ Good ☐ Fair ☐ Poor
12. I FIRST HEARD ABOUT SOFT SECTOR:
    ☐ From a friend
    ☐ Saw it on a magazine rack
    ☐ Subscription card enclosed in a software purchase
    ☐ A dealer referred me to it
    ☐ Through Sanyo Business Systems
    ☐ Other _____
13. I WOULD LIKE TO SEE SOFT SECTOR OFFER MORE:
    ☐ Reviews ☐ Utilities
    ☐ Games ☐ Hardware projects
    ☐ Educational programs ☐ Tutorials
    ☐ Business programs ☐ Machine language info.
    ☐ Program listings in languages other than BASIC
    ☐ Other _____
14. I THINK YOUR PRODUCT REVIEWS ARE:
    ☐ Just right ☐ Too short ☐ Too few
    ☐ Too critical ☐ Too long ☐ Too many
    ☐ Too generous
15. DO OUR REVIEWERS SEEM:
    ☐ Well qualified ☐ Qualified ☐ Under qualified
16. DO YOU WAIT TO SEE A REVIEW OF A PRODUCT BEFORE BUYING?
    ☐ Always ☐ Usually ☐ Sometimes ☐ Never
17. NUMBER OF PRODUCTS I HAVE PURCHASED AS A RESULT OF SOFT SECTOR ADVERTISING:
    ☐ None ☐ 1 ☐ 2-5 ☐ 5-10
18. DO YOU USE THE ADVERTISERS' INDEX?
    ☐ Yes ☐ No
19. ARE YOU HESITANT TO BUY FROM A NEW ADVERTISER?
    ☐ Yes ☐ No
20. ARE YOU MORE INCLINED TO BUY AFTER SEEING A PRODUCT ADVERTISED:
    ☐ Once ☐ Six times
    ☐ Two or three times ☐ More than six times
21. WOULD YOU LIKE FOR US TO FOCUS EACH ISSUE ON A PARTICULAR THEME?
    ☐ Yes ☐ No ☐ Don't care
22. WOULD YOU PURCHASE OR SUBSCRIBE TO SOFT SECTOR'S PROGRAMS ON DISK?
    ☐ Year's subscription ☐ Never
    ☐ Occasionally
23. IS THIS YOUR FIRST COMPUTER SYSTEM?
    ☐ Yes ☐ No
    ☐ No, but I'm still a novice
24. YOUR AGE:
    ☐ 18 or under ☐ 26-35 ☐ 46-65
    ☐ 19-25 ☐ 36-45 ☐ Over 65
25. YOUR OCCUPATION?
    ☐ Engineer/Technical ☐ Business person
    ☐ Student ☐ Educator
    ☐ Professional ☐ Skilled Trade
    ☐ Retired ☐ Unemployed
26. YOUR HOUSEHOLD INCOME:
    ☐ under $10,000 ☐ $31,000-$50,000
    ☐ $10,000-$20,000 ☐ $51,000-$75,000
    ☐ $21,000-$30,000 ☐ over $75,000
27. DO YOU USE ANOTHER PERSONAL COMPUTER?
    ☐ At home ☐ At work
    ☐ Brand _____ ☐ Model _____
28. WOULD YOU BE INTERESTED IN ATTENDING A TRADE SHOW OF SOFT SECTOR ADVERTISERS
    ☐ Yes ☐ No ☐ Don't know
29. DO YOU READ OUR DEPARTMENTS:
    BASIC Training ☐ Yes ☐ No
    Mastering MS-DOS ☐ Yes ☐ No
    Input/Output ☐ Yes ☐ No
    Business Sector ☐ Yes ☐ No
    Letters to the Editor ☐ Yes ☐ No
    Soft Talk ☐ Yes ☐ No
30. WOULD YOU LIKE SOFT SECTOR TO HAVE AN EDITORIAL PAGE?
    ☐ Yes ☐ No ☐ Don't care
31. WHAT WOULD YOU LIKE TO SEE IN SOFT SECTOR THAT WE DO NOT HAVE NOW? _____

ASC(``a'') — using a lowercase 'a' inside the quotes — the computer PRINTs 97. That's because an upper- and lowercase letter have different ASCII values.

String Comparisons

Strings can be compared just like numbers. Strictly speaking, strings are only numbers to a computer anyway. Each character is represented by an ASCII number, so comparing strings is really only a matter of comparing the ASCII number of each character as far as the computer is concerned.

The important thing to keep in mind here is that every character has a different ASCII value, and lowercase letters are different from uppercase letters.

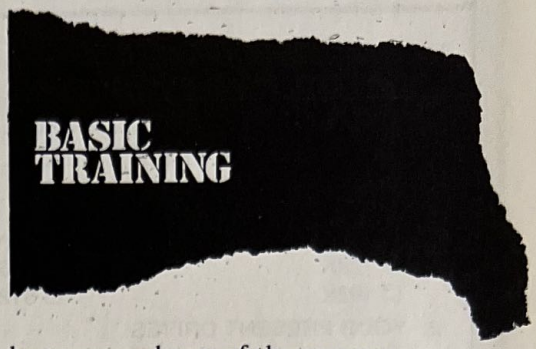
With a computer, close doesn't count. Unless there's a perfect match between every character in two strings being compared, the computer considers them different.

"Passwords" are a good example of string comparisons. Type and ENTER Listing 6.

When you RUN this program, if you type in anything but "Password" (no quotes, but with a capital P), the computer will BEEP a warning and call for your arrest. Of course, you can program any word (or character string) you desire in place of "Password" in program Line 20.

Super Strings

There are times when you wish to repeat a character several times on one line, such as to draw a horizontal borderline. The command used for this is STRING$. You must also specify the number of characters to be repeated and the character desired. The latter may



be expressed any of three ways:

1) You may use the ASCII code number.
2) You may enclose a keyboard character in quotes.
3) You may specify a string variable, in which case the first character of that string will be used.

Type and RUN Listing 7 for some examples of how STRING$ can be used. Figure 1 shows the results.

If you want this on your printer,

change the PRINTs to LPRINTs — but you may have to change some of the codes to conform to your printer character set. For example, in program Line 60, I had to change the three (which is the ASCII code for a heart in the Sanyo 550/555 character set) to 144 for my printer (CP80 Type/Legend 100) to produce the heart character.

Coming Up

Everyone knows that computers are "number crunchers." Next month, we will look at some of the simple math functions available in Sanyo BASIC.

(Fred Blechman, an acknowledged authority on home computers, has written several articles and books related to microcomputers. He is self-taught in electronics and computer BASIC programming and specializes in writing for beginners. This article is based on material from a forthcoming book by the author, Sanyo MBC-550/555 Beginner/Intermediate Guide, *soon to be published by Holt, Rinehart and Winston, a division of CBS College Publishing.)* Copyright© 1984 by Fred Blechman.

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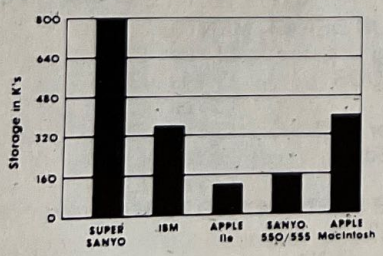

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Listing 1: Stringing along.

```
10 A$="John Smith"
20 B$="1234 Broadway"
30 C$="Anytown"
40 D$="CA 99999"
100 CLS:PRINT :PRINT
110 PRINT "Which of the following do you want?
120 PRINT "(1) Name?"
130 PRINT "(2) Street?"
140 PRINT "(3) City?"
150 PRINT "(4) State/ZIP?"
160 PRINT "(5) Entire Address?"
200 PRINT:PRINT
210 INPUT"Select number and press ENTER.....":N:PRINT:PRINT
220 IF N<1 OR N>5 THEN GOTO 210
300 ON N GOTO 400,500,600,700,800
400 PRINT"The name is ";A$:GOTO 1000
500 PRINT"The street address is ";B$:GOTO 1000
600 PRINT"The city is ";C$:GOTO 1000
700 PRINT"The state/ZIP is ";D$:GOTO 1000
800 PRINT A$:PRINT B$:PRINT C$:PRINT D$
1000 PRINT:INPUT"Again (Y/N)";R$
1010 IF R$="y" OR R$="Y" THEN GOTO 100
1020 PRINT"Glad to help. Bye for now....."
```

Listing 2: Dissecting DATE$

```
10 REM * DATE DEFINER - The hard way.....  *
20 A$=LEFT$(DATE$,2)
30 B$=MID$(DATE$,4,2)
40 C$=RIGHT$(DATE$,4)
100 IF A$="01" THEN A$="January":GOTO 300
110 IF A$="02" THEN A$="February":GOTO 300
120 IF A$="03" THEN A$="March":GOTO 300
130 IF A$="04" THEN A$="April":GOTO 300
140 IF A$="05" THEN A$="May":GOTO 300
150 IF A$="06" THEN A$="June":GOTO 300
160 IF A$="07" THEN A$="July":GOTO 300
170 IF A$="08" THEN A$="August":GOTO 300
180 IF A$="09" THEN A$="September":GOTO 300
190 IF A$="10" THEN A$="October":GOTO 300
200 IF A$="11" THEN A$="November":GOTO 300
210 IF A$="12" THEN A$="December"RUN
300 PRINT A$;" ";B$;" ";C$;"     ";TIME$
```

Listing 3: Rare Form Of MID$

```
10 A$="1234567890"
20 B$="abcdef"
30 MID$(A$,5,3)=B$
40 PRINT A$,B$
```

Listing 4: String concatenation.

```
10 A$=" my "B$="I ":C$=CHR$(3):D$="Sanyo!"
20 PRINT B$+C$+C$+C$+C$+A$+D$
```

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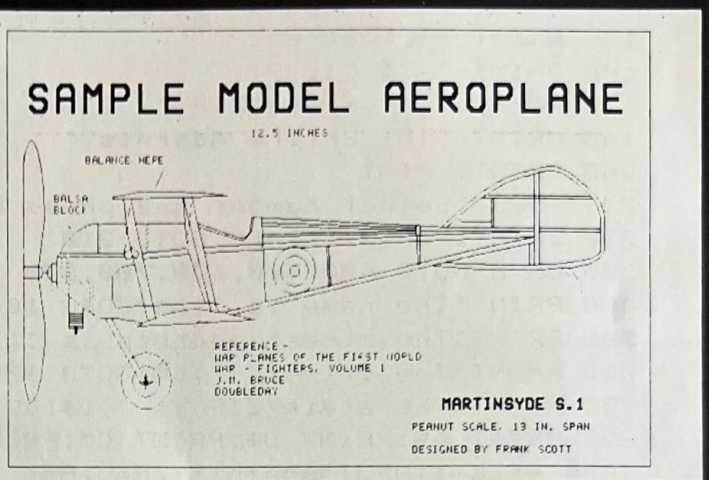
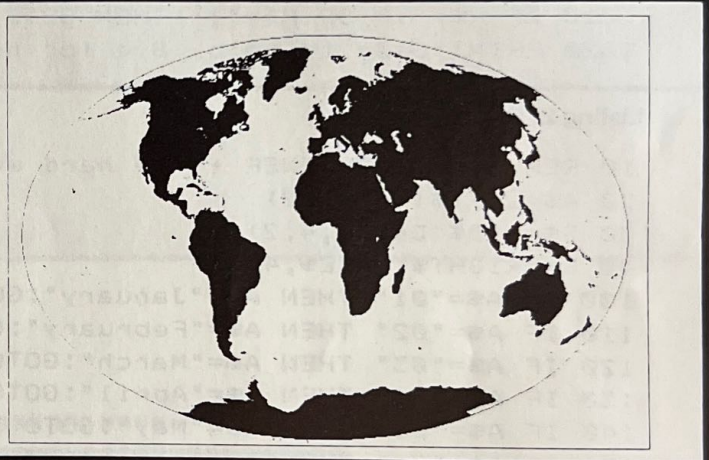
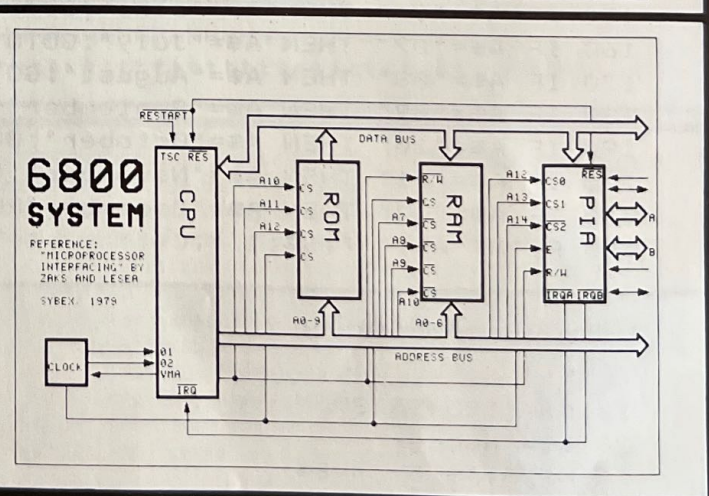
* Allows text and figures to be slanted in any direction, giving modern or three-dimensional effect.
* Provides for user-created files to be input and displayed on the screen. This allows data from other programs to be used.







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Listing 5: String/number conversion.

```
10 A=123:B=456:C=7890
20 PRINT A+B+C
30 A$=STR$(A):B$=STR$(B):C$=STR$(C)
40 PRINT A$+B$+C$
50 D$="7654 Main st."
60 PRINT VAL(D$)
```

Listing 6: Comparing strings.

```
5 CLS
10 INPUT"What is the password";A$
20 IF A$="Password" THEN GOTO 40
30 BEEP:BEEP:BEEP:BEEP:BEEP:GOTO 50
40 PRINT"You may pass.....":END
50 PRINT"Guard!! Arrest that imposter!!"
```

Listing 7: "Super Strings."

```
10 A$="Harry"
15 B$="testing"
20 PRINT STRING$(20,45)
30 PRINT STRING$(30,95)
40 PRINT STRING$(40,"*")
50 PRINT STRING$(50,"#")
60 PRINT STRING$(60,3)
70 PRINT STRING$(70,A$)
80 PRINT STRING$(80,B$)
```

Figure 1: "Super Strings."

```
--------------------

_________________________________
**************************************
##################################################
♥♥♥
```

The Sanyo 775 —

An IBM Compatible For People On The Move

PHOTO BY NEAL C. LAURON

With Sanyo's new portable in hand, we now embark on a journey into the belly of the beast.

By Danny Humphress
Soft Sector Technical Editor

When Sanyo introduced the MBC-550/555, an MS-DOS machine at an astonishingly low price, it was hailed as the affordable alternative to the IBM PC. The 550/555 offers more built-in features and much better graphics than the IBM PC, but at about one third of the price. Even though not fully compatible with the ever-popular IBM PC, the Sanyo machine has made its own place in the realm of personal computers and it continues to win the hearts of computer users.

Hoping to recreate the success of the MBC-550/555, Sanyo has introduced a sister machine, the MBC-775. While both machines are MS-DOS-based, 16-bit computers, the 775 is a portable machine that is, for all practical purposes, totally compatible with the IBM PC. To contribute to the success of the new machine, Sanyo is following its path for the 550/555: offering a feature-packed machine at an attractive price. At a suggested retail of $2,599 with two 360K drives, 256K RAM, parallel printer port, two IBM-compatible card slots, a high resolution color monitor, *EasyWriter II*, *Easy-Planner*, *Easy Filer*, MS-DOS 2.11, and GW-BASIC, the 775 fits the description of an attractively-priced computer.

Now that the hype is out of the way, let's take a closer look at this machine.

"Luggability"

The term "portable computer" has been used to describe anything from a three pound, lap model to the 30-pounders that come with a supply of Ben Gay to soothe the muscle strain caused from a day of lugging the computer through airports. Weighing in at a hefty 26 pounds, the new Sanyo leans toward the term *luggable*, rather than *portable*. The Sanyo is more than just a PC with a handle, though; it packs all the necessary computer components except the printer into one neat and easy-to-move package.

In an innovative style, the 775's keyboard locks onto the "front" of the computer forming the bottom of the unit during transportation. With the computer "closed" this way, the keyboard covers the display and the disk drives. While we were fortunate enough not to have the keyboard fall off while moving the computer, the method used to lock the keyboard to the computer does not seem very secure and it takes a few tries to get it put together properly.

The back of the computer has three doors that protect and cover the expansion slots, external monitor connectors and internal monitor controls, and the power cord and fuse. The back also includes a recessed handle for when the computer is being toted about.

Ergonomics

The Sanyo 775 keyboard is arranged almost identically to the IBM PC's with a few minor improvements. While the key placement is not ideal, it makes it easier to use programs designed to work with the IBM's keyboard. The keyboard seemed to have a better feel than the 550/555s, but it lacks the "snappiness" of higher-quality keyboards such as those on the IBM PC or the Tandy 1000.

The built-in color monitor on the 775 provides a sharp graphics display with vivid colors and contrast. It is so nice to see a computer, especially a portable, that comes standard with a color monitor. And the monitor Sanyo chose to use in the 775 is exceptional. At only nine inches diagonally, it's small, but

(Danny Humphress, SOFT SECTOR's Technical Editor, is the owner of a computer software and consulting firm in Louisville, Ky.)

it's quite easy to read while seated at the computer.

Aesthetically, the Sanyo MBC-775 is about as attractive as its 550/555 sister — it's not much to look at. The case is a gray plastic and its overall design doesn't look at all "high tech." When closed, it looks more like a portable sewing machine than a computer. Of course, beauty is only skin (or should I say "case") deep, and the real attractiveness of the machine lies within. From a marketing standpoint, though, when something *looks* expensive, people generally think that it is worth more, and are, therefore, willing to pay more for it. It's not logical, but it *is* a fact — a fact that may subconsciously move potential buyers away from the 775.

Software Compatibility

Sanyo calls the 775 a "99 percent IBM compatible," cautiously falling one percentage point short of 100 percent. However, we found no piece of IBM PC software that would not run on the Sanyo. This includes the "benchmark" of software compatibility, Microsoft's *Flight Simulator*. Other popular IBM programs that worked well under testing include *dBASE III*, *Lotus 1-2-3*, *Framework* and *Sidekick*. Copy protected programs such as these often cause problems with computers not fully IBM PC compatible, but they ran flawlessly on the Sanyo.

Microsoft GW-BASIC, included with the Sanyo MBC-775, is essentially identical to IBM's BASICA. This insures that virtually all IBM PC BASIC programs will work on the Sanyo machine.

Hardware Compatibility

One of the factors contributing to the success of the IBM PC is the availability of option cards from third party sources. These cards allow you to configure your system to just about anything you can imagine. You can add networking, hard disks, mouse interfaces, clock/calendar boards, RS-232 interfaces, digitizers, modems, and the list goes on. We tried some of the more popular add-ons for the IBM PC and and found them all to work perfectly. Among those we tried were the Quadram Quadboard, Microsoft Mouse, and AST SixPakPlus.

The Sanyo only has two free expansion slots, one less than a similarly-configured IBM PC, but the availability of multifunction boards such as Quadboard make this limitation less bothersome. Multifunction boards combine the functions of several boards (usually memory, clock, RS-232, joystick, and parallel printer) onto a single card.

Graphics

Although Sanyo's original press release stated that the 775 supported 16-color pixel graphics, we could not find anything in the documentation or in actual use to substantiate this claim. In actuality, we found that the machine's graphics specifications are identical to the IBM PC's. The 775 has three display modes: 25 by 80 text and character graphics in 16 colors, 320 by 200 graphics with four colors, and 640 by 200 graphics with two colors. By the way, the number of colors stated includes the background color.

The graphics of the 775, while not as nice as the 550/555's, provide total compatibility with software such as *Lotus 1-2-3* and the Microsoft *Flight Simulator* (after patching).

GW-BASIC

Sanyo left behind its Sanyo BASIC in the name of compatibility. Microsoft's GW-BASIC, which shares its roots with IBM's BASICA, has become the standard interpreter BASIC for MS-DOS machines and is the BASIC supplied with the 775.

While very similar to Sanyo BASIC, GW-BASIC offers some features not found (or implemented) in Sanyo BASIC. Among these are commands to change the disk directory, control the light pen, do I/O on the serial port, and to execute DOS commands directly from BASIC. GW-BASIC is missing the SYMBOL command, though, which was one of the nicest features of Sanyo BASIC.

We found editing BASIC programs with GW-BASIC much easier than with Sanyo BASIC. With Sanyo BASIC, you must switch from two different modes to edit a program, pressing BREAK to return to the command mode after editing. GW-BASIC is much more straightforward, allowing you to move the cursor *anywhere* on the screen and edit lines, make new lines, or even enter commands. If you want to execute a command again, just move the cursor over the command on the screen and press ENTER.

An added advantage of GW-BASIC is that there is a compatible compiler available from Microsoft that will compile all strictly BASIC programs with little or no modification.

Adding On

Gaining access to the inside of the Sanyo 775 requires removing the top cover, which is held in place with two screws. You then must remove two aluminum panels by loosening eight additional screws. While this is a bit cumbersome for adding cards, it is not something that you would need to do often.

Once you have the case open, you have access to the two expansion slots available for Sanyo add-on boards and other IBM compatible expansion cards. These cards slide into place and are secured with a single screw.

As mentioned earlier, one of the back panels opens to reveal two connectors for external monitors. Connections are provided for an external RGBI monitor and a composite video monitor.

A Centronics-type parallel printer interface is standard equipment on the 775. Unlike the Sanyo 550/555, the new machine uses a DB-25 connector to connect the printer cable to the computer. This is the same type cable used with the IBM PC. Other than the cable difference, all parallel printers that work with the 550/555 should work on the new 775.

Documentation

Keeping in form with their other computers, Sanyo has provided documentation that tells you a little about everything and a lot about nothing. They give you just enough information to know that you need more. A single skimpy manual serves as a reference guide to the hardware, MS-DOS and GW-BASIC, and is the only real documentation provided with the machine. In Sanyo's defense, though, they did provide some technical information such as a memory map and BIOS calls in the back of the manual.

Conclusion

Priced well below a similarly-configured IBM system, the Sanyo MBC-775 should fare well. It's a fine, well-engineered machine that should carry on Sanyo's tradition superbly. However, the competition is tough from other IBM compatibles and MS-DOS machines — even from Sanyo's own 550/555. What is really needed to make this machine fly is more of the formula that got the 550/555 off the ground: price it *ridiculously low*! This situation is sure to improve once the machine is in the hands of local computer dealers and mail-order discounters. When this happens, Sanyo could have another blockbuster on its hands.

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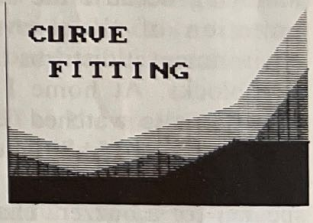

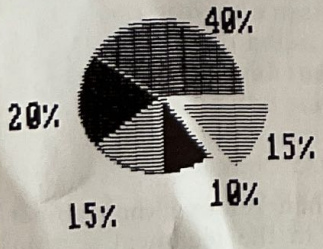

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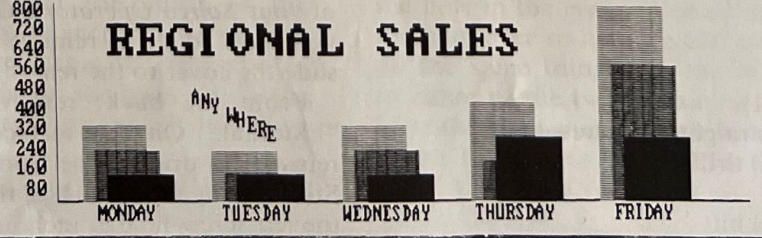

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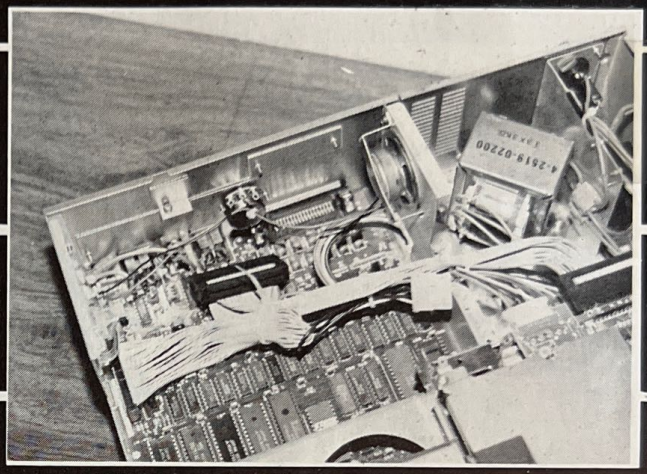


Inside view: Note that contacts are on top.

Beep! Beep! Beep! My Sanyo had the very annoying habit of waking everyone in the house with its alarm-style noisemaker. It was too loud and, in my opinion, annoying because the sound produced was a very good imitation of the proverbial raspberry. In an office environment it disturbs the user and everyone within three city blocks. At home I could not use my Sanyo while someone else watched TV or slept, and since I do a lot of work there, I had to devise a solution.

I was surprised that Sanyo used a small eight-ohm speaker for a buzzer. That made the addition of a variable resistor (commonly called a "pot" or "potentiometer") easy. All that you have to do is mount a 5k ohm potentiometer and connect it in series with the speaker to gain control of the volume. If you have limited experience with electrical or electronic work, read on. If you know your NPNs from your triacs, skip to the next-to-the-last paragraph.

Tools And Materials Needed

1) Small soldering iron
2) Resin core solder
3) Phillips screwdriver (#1)
4) Very small (jeweler's) straight-slot screwdriver
5) Small electric (or hand) drill
6) 5/16-inch drill bit
7) 9/64-inch or 5/32-inch drill bit
8) Punch or small nail
9) Small rattail file
10) Small flat file
11) Small piece of fine sandpaper
12) Hacksaw
13) 5k ohm Audio Taper Potentiometer (Radio Shack No. 271-1720, $1.09)
14) Knob for ¼-inch potentiometer shaft (Radio Shack No. 274-403, 79 cents)

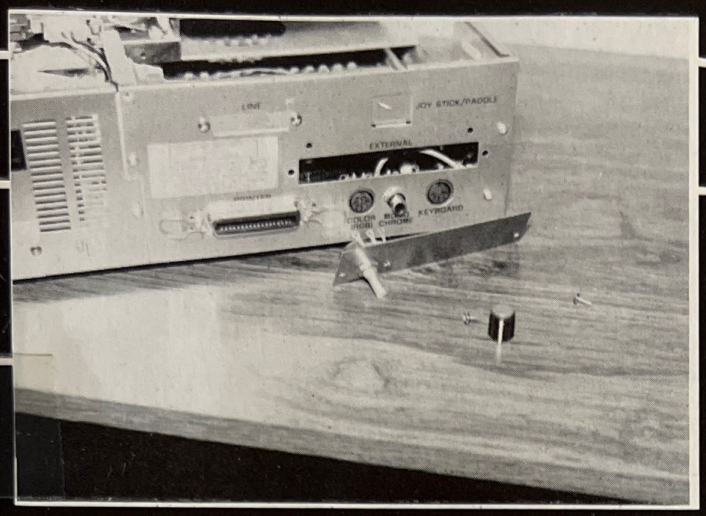
Optional Tools:

1) Small side cutters (dykes)
2) Small needle-nose pliers
3) Knife
4) Wire strippers

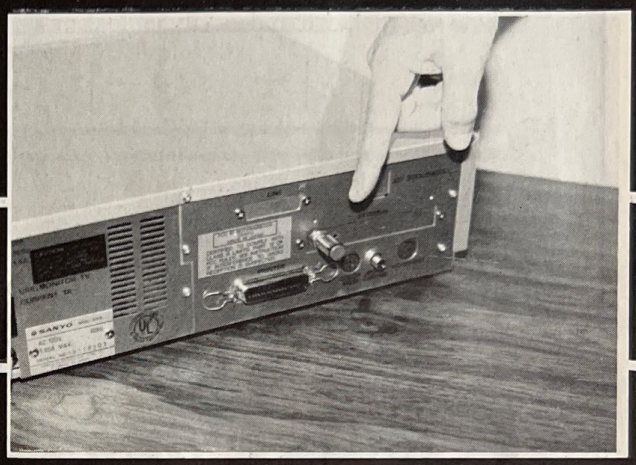
How To Do It

Unplug your computer and then remove the cabinet cover. Instructions are provided in the technical section of your *Sanyo Operator's Guide*, Page 6-3. Essentially, all you have to do is remove five Phillips-head screws and slide the cover to the rear.

From the back, remove the plate that is labeled "External." On the surface that will show when it is reinstalled, draw a line from one screw hole to the other. Still looking at the surface that will show, measure in from the left screw hole 5/8 inch and mark the spot. Then, again



Pot mounted on external plate prior to installing and soldering.



Easy, out-of-the-way, and neat!

By Mick McGuire

measure in from the left screw hole 1⅛ inch and mark that spot. Both spots should be on the line you drew between the screw holes. The first spot that is ⅝ inch from the screw hole is where you will drill a 5/16-inch hole, and the other spot is where you will drill a 9/64 inch or 5/32-inch hole.

If you have never used a drill before, get someone you trust to show you how to safely use it. Take the punch or small nail and dimple the metal on the spots you previously marked. These dimples will serve to guide your drill bits and provide a more accurately positioned hole.

Now drill the two holes. It might be a good idea if you drill both holes first with the small drill bit, and then enlarge the hole closest to the screw hole with the 5/16-inch bit. Now use your files and sandpaper to clean off all the rough edges and burrs. (*Note: Do not do any of the above work at or near your computer, as the metal shavings will completely ruin it if allowed to get into the cabinet.)*

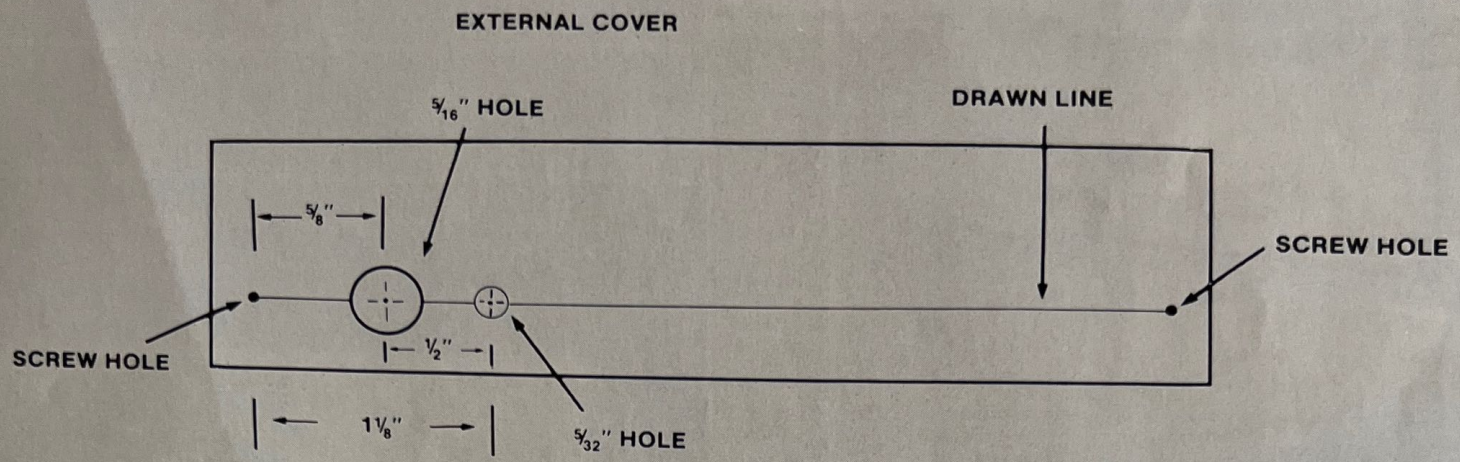
Use your hacksaw and cut off the shaft of the potentiometer (pot) so that only ½ inch of the smooth part of the shaft is left (measured from the very end of the threaded part). Use your file or sandpaper to clean up the ragged end. Do not let any shavings or metal dust get into the pot.

Now mount the pot so that the shaft sticks through the large hole and the metal tab sticks through the small one. If you did everything correctly, the back of the pot will be oriented so the contacts (three metal tabs on the back) will be uppermost when you reinstall the external plate, which you should now do using the same screws it had before. The shaft should now be outside the cabinet and the back of the pot should be positioned so that you have easy access to the contacts.

Locate the pair of wires connected to the speaker. One is red and the other is black. There should be enough slack in the wire so that you can route it to the back of the pot. Using the side cutters (or a knife if you are careful), cut the *black* wire at a point where both ends of the wire will reach the pot we mounted earlier. Heat up your soldering iron at this time.

Using wire strippers, the dykes or a knife, strip the insulation from the ends of the wire that you just cut to a point about ¼ inch from the end. Now twist the strands of wire you just exposed, thread the end of one wire through the hole in the center contact of the pot, and gently bend the wire over so it will make contact and stay there. Now do the same thing with the other wire, except attach it to either of the two remaining contacts. You should now have the bare ends of each wire hooked physically to the center tap and to the end tap of the pot — one wire to each. The other contact is not used on the pot, so don't worry about it.

FIGURE 1. OUTSIDE FACE



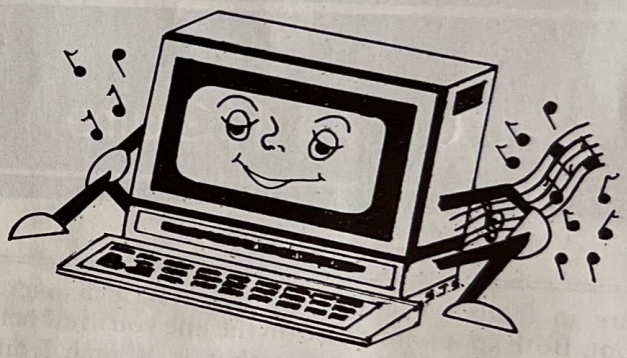


FIGURE 2

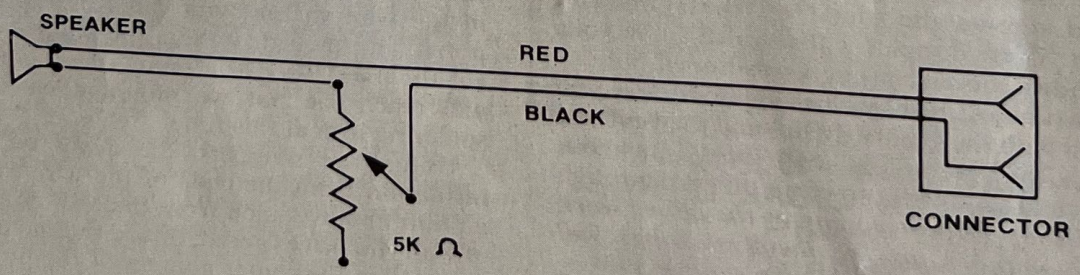
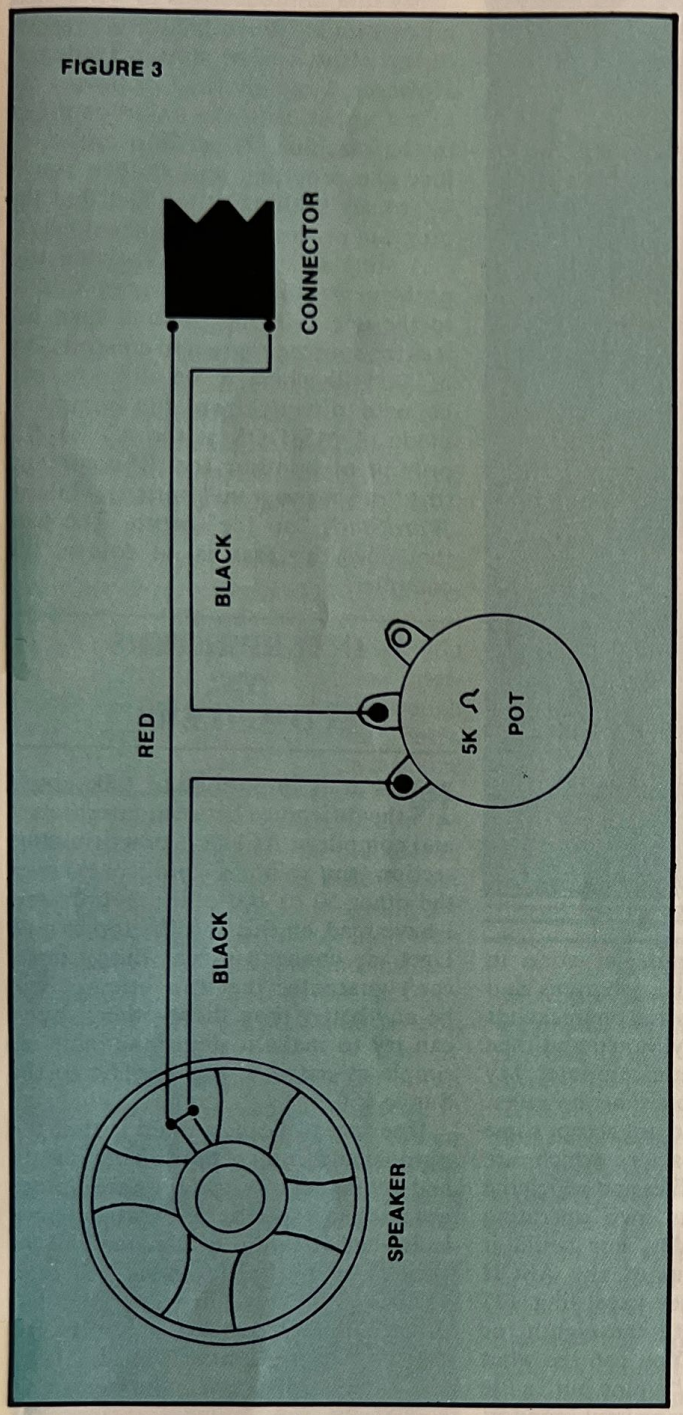


FIGURE 3



Now take your soldering iron and solder the wires to their respective contacts. Make sure you do not drip any excess solder into the cabinet and clean up any drippings and "solder bridges" you may have left. If you have never done this before, practice with spare wire somewhere else until you get the hang of it. The two rules to remember are: always heat the work and then add the solder to it (never heat the solder and try to drip or run it on) and always keep the iron and the contacts clean. Also remember that solder contains lead, so never put any of it into your mouth and get rid of any solder scraps you are left with.

Take this opportunity to check your work. Install the knob onto the shaft using the small setscrew and the jeweler's screwdriver, and then reinstall the cabinet cover. You now have a volume control!

For The Experienced Hobbyist

Using the two Radio Shack parts found in the parts list, install the pot on the external port cover or any other suitable place near the speaker. Cut the black wire going to the speaker and solder one end to the pot's center tap and the other end to either of the two remaining contacts. Clean up the mess and you are done!

What You Have

You may now, using the volume control, make your Sanyo beeper as quiet as you wish. The potentiometer simply adds resistance to the line going to the speaker. There are other more suitable audio pots than the Radio Shack 5k ohm one specified, but I elected to use it because it is inexpensive and available almost everywhere. No searching for parts, just go to Radio Shack. If you already have tools and solder, or can borrow them, the entire project will cost only $1.88 plus tax.

(Mick McGuire, now in his 18th year of active duty for the U.S. Navy has been writing and selling computer software and magazine articles since 1978. He may be contacted at 2234 George Wythe Rd., Orange Park, FL 32073, 904-272-5596.)

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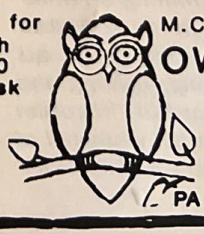

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For those with a desire to be multilingual, here is our first look at another of the available programming languages.

Compilers And The C Language

By John D. Unger

Why would anyone want to use a C compiler? What is C? What is a compiler? And, most importantly, what do compilers have to do with the Sanyo MBC-550 series of computers? These are the kinds of questions I hope to be able to answer in this article.

The Sanyo MBC-550/555 is an extremely powerful microcomputer, fully as capable and versatile as other computers costing thousands of dollars more. However, many of the Sanyo's real strengths and capabilities are either hidden or difficult for the user to discover from the normal software and documentation that comes with the computer.

For example, when I bought my Sanyo I planned to use it to communicate with a minicomputer at work. In this way, I could write programs and reports in the evenings and on weekends with *WordStar* on my Sanyo and then transfer them to the minicomputer. My plans quickly ran into a snag, however. The host computer did not accept some of the control characters which are present in *WordStar* files and which the computer uses as its own operating system's internal codes, nor could it make much sense out of any ASCII characters with values exceeding 127 (those characters with the eighth, or highest, bit set on). You can see what I'm talking about by "typing out" a file created with *WordStar* on your monitor; you will see a bunch of Greek letters and other funny looking graphics characters that you didn't think were in the file. This problem did not exist if I created the file with the 'N', or non-document option of *WordStar*, but that option makes it very awkward to use some of the powerful formatting features of *WordStar*. What I needed was a simple program to "filter" *WordStar* files from their native format with special printing and formatting control characters into a normal ASCII file which would be acceptable to any other computer.

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My first approach was to write such a program in Sanyo BASIC; the results of this effort can be seen in Listing 1. However, I rapidly tired of having to: 1) put a disk with the BASIC compiler in the machine, 2) get into BASIC, 3) load the program, and 4) then run it — to say nothing of the fact that the program processes files rather slowly.

A simpler approach to solving this problem was to write a program similar to the one in Listing 1, and then use it as the source program to create a .EXE or .COM file which, as we all know, can be used directly from the command mode of MS-DOS at the A> or B> prompt or by using the 'R' command (the "run a program" option) while in *WordStar*'s "no file" menu. The tool that does this task is, of course, the compiler.

INTERPRETERS VS. COMPILERS

Now it is important to talk about the difference between interpreters and compilers. As I sit here writing this section, my mind is going back over the other 50 or 100 other descriptions I have read on this specific topic; now I get my chance to clear things up! I can't guarantee that this attempt will be any better than those others, but I can try to make it understandable, as simple as possible, and specific to the Sanyo 550/555.

One fact to keep in mind is that the purpose and result of both an interpreter and a compiler is to make your computer accomplish a specific task that you have instructed it to do. Either one will do this. The big differences between various computer languages and between compilers and interpreters has to do with factors like how fast the computer does the task or how easy and convenient it is to tell the computer exactly what you want it to do. The remainder of the article will be aimed at giving you some information to help you decide whether a compiler would be a worthwhile addition to your inventory of software, and to show you how I have used one compiler for the C language to utilize the features of my Sanyo 550.

An excellent example of an interpreter is the program that comes with your Sanyo in the form of a file called BASIC.EXE. This is, of course, the interpreter for the Sanyo BASIC, or SBASIC, programming language. This

.EXE, or machine language program, was originally written in assembly language (more about that later), probably by some gurus at Sanyo in Japan and is, most simply, a translator; it translates SBASIC commands (programs) into machine language instructions that the CPU (Central Processing Unit) at the heart of your computer understands.

For your Sanyo 550/555 to understand SBASIC commands, you first have to run the program BASIC.EXE by loading it into the computer's RAM, or Random Access Memory, and then executing its machine language code (this is what happens when you type the command BASIC). While the program BASIC.EXE is running, it has control of your computer, and in this role, *interprets* everything that you type into the keyboard. When you RUN SBASIC to execute the program that you have written or loaded into the interpreter, the interpreter then steps through that program on a line-by-line basis, translates each instruction into machine language, and then sends these instructions to the CPU, which obeys the instructions and does what it is told to do. The interpreter simply follows your logic through the entire program; for example, if you have a FOR loop with 500 iterations, the interpreter translates, or interprets, all the instructions contained in the loop each time the loop is repeated.

Two important properties of an interpreter should now be apparent: 1) the SBASIC commands in a program don't mean a thing to your computer without the program BASIC.EXE running to interpret them, and 2) the interpreter

has to translate each and every SBASIC instruction into machine language every time your SBASIC program is RUN.

Compilers take a more involved path, at least initially, to achieve the desired result of your program telling the computer what to do. The compiler and its related programs constitute a process which is analogous to the interpreter in many ways, but with some important differences. Usually a "compiler package" consists of three or more separate programs in the form of .EXE or .COM files containing machine language programs. First is the compiler itself, whose job it is to translate your source code or program (which is written in whatever language your compiler translates, such as FORTRAN, C, BASIC, or some other) into a language common to the CPU for which the compiler was written — in our case, that is assembly language for the 8088/8086 family of microprocessor chips. For the purposes of our discussion, we can consider this assembly language to be unique to and understood by all 8088 and 8086 processors.

After this first step, another program translates the assembly language into the machine language understood by the computer. And, finally, a third program links, or joins, your machine language program with other programs or functions that it may call from a library of such routines (all written in machine language) and puts the whole package into the form of an .EXE or .COM file.

To go back for a moment to our hypothetical FOR loop mentioned earlier, that loop has now been compiled and still exists in the machine language code. However, the loop now runs completely in machine language and, therefore, can repeat at least two or three orders of magnitude faster than when run as interpreted code.

We can already see some important differences between an interpreter and a compiler. With the compiler you are required to put your source program through two (sometimes the first two steps are combined) or three separate programs before you even know if it will work as you think it should! However, when you are finished with the process, you have a compact .EXE or .COM file that can be invoked just by typing in its name from the MS-DOS prompt. The compiled program is completely independent and doesn't need the compiler any more, nor does it need an interpreter to make it run, and it will carry out your instructions many times faster than the same program when run under an interpreter.

There are some further, more subtle differences if you think about them. For instance, with BASIC you usually write your program within the interpreter (with the AUTO command, for example). But with a compiler you must create your program with another program—an editor such as *WordStar* or *EasyWriter*. In case you have wondered, there is nothing at all wrong with writing a BASIC program using *WordStar* or any other editor. In fact, it is sometimes easier to do it that way when you are copying a long program from a book or magazine, especially if the program you are copying does not have uniformly numbered lines and, therefore, is inconvenient to copy using the AUTO feature of SBASIC. You do have to remember to use the 'N' or "non-document file" option of *WordStar*, though, and it's a good practice to save the program with a filename which includes the .BAS extension.

One final difference between interpreters and compilers remains to be discussed. With an interpreter you discover immediately whether or not your program code has the correct syntax and if it will produce the desired results. With a compiler, the first step, compilation, will catch the syntax errors in the code, but you will have to go through one or two further steps before you know if the program gives the correct results. In my experience, what these differences mean in actual use is that more experienced programmers, who understand a language's capabilities and syntax well, prefer to use compilers; less experienced computer users can gain a lot from getting the more immediate feedback on their errors from an interpreter.

BASIC VS. C

Many of you who have struggled this far are probably asking yourselves: "What's all this noise about; can't we have the best of both worlds by using the SBASIC interpreter for developing our programs and then a BASIC compiler to turn these same programs into fast, compact and portable .EXE or .COM files?" This observation is true enough with a couple of *very* important exceptions: 1) you should remember that there is *no* compiler that has been written expressly for SBASIC, which means that certain commands and virtually all the graphics capabilities of SBASIC cannot be compiled by *BASCOM* or the other BASIC compilers (see "Bridging the Compatibility Gap," by Laurence L. Raper, in the August '84 issue of SOFT SECTOR); and 2) you are stuck with writing all your programs in SBASIC which, like virtually every other dialect of BASIC, is an unsuitable computer language for writing structured programs and for writing many useful applications-type programs. I am not critical of SBASIC

alone; in general, the Sanyo dialect is no better or worse than the other 10 or 20 versions of BASIC that are floating around.

About seven months ago, I was at this point with my programming on the MBC-550. The alternative that I chose was to buy a compiler package for the C language. C is simple (not much code or syntax to learn), highly structured (the syntax is designed for putting together packages of code that logically "flow" down through a program, that is, no need for GOTO statements), and strongly typed (you must declare, up front, whether a variable you plan to use in a program is going to represent an integer, a character, a floating point number, etc.).

Perhaps the most important attribute of C is its strict adherence to the concept of being a completely "portable" language. What this means, simply stated, is that when you write a program in C source code, that source code can be compiled on almost any computer that has a C compiler available for it. The results or output of your program will be the same, independent of the computer. There are virtually no "dialects" of the C language floating around, which eliminates the problem with the BASIC language where machine and operating system idiosyncrasies abound.

The way that C accomplishes its portability is by using a library (remember the "link" step in compilers?) of functions and subroutines that do the actual work to interact with each individual computer's input/output and other machine-dependent characteristics, but this doesn't often affect the programmer and is mainly a concern for the person who writes linker and library routines. These library routines can also contain functions that are specific to the operating system or to the computer being used.

I will not attempt to tell you how to write a C program in this article, but I will give you a simple example (see Listing 2) and can recommend some books and sources to get you started. The best book I have found, by far, is the *C Programming Guide*, by Jack Purdum. Its only shortcoming as far as the Sanyo 550/555 is concerned is that certain sections are geared towards eight-bit microcomputers, but those sections are obvious and do not in the least reduce the usefulness of the text as a whole.

The bible of the C language is *The C Programming Language*, by Brian Kernighan and Dennis Ritchie. This book is extremely useful as a reference text because it gives the standard syntax and language extensions for C. I would advise you to read this book after you have gone through Purdum's and have been doing some programming in C.

Another good source for those of you wishing to learn more about C is in the August 1983 issue of *Byte* magazine, which was dedicated to C and has a series of articles dealing expressly with the language. That issue of *Byte* was also the source of another important resource for me because it contains excellent reviews of C compilers for 8088/8086 based microcomputers. It was on the basis of these reviews that I chose the compiler I use on my Sanyo 550, the DeSmet compiler. The factors that I considered important in selecting my compiler were speed of compilation and linking, cost, and most importantly, compatibility with the Sanyo 550/555. A plus for the DeSmet compiler is that it has functions built into its library that allow you to utilize all the power of the 550/555, including graphics. Other compilers written for MS-DOS computers, either for C or for another language, may also be suitable for use with the 550/555, but I know for a fact that these features are present in the DeSmet compiler and that the company that markets the DeSmet compiler, C-Ware, Inc., has a Sanyo MBC-550 on site and can advise you on problems particular to our machine.

An important caveat should be mentioned here: don't expect to learn how to program in C by reading the documentation that comes with the DeSmet or with any other compiler. The compiler instructions are very terse and assume that you already know how to write C programs that run. They will tell you how to use their products and little more. You will need to get one of the books mentioned above or some other text to teach you how to program in C.

"You should remember that . . . SBASIC, like virtually every dialect of BASIC, is an unsuitable computer language for writing structured programs and for writing many useful applications-type programs."

USING A C COMPILER

As a contrast to the familiar process of running an SBASIC program and in order to let you get the feel of how a compiler is actually used, I am going to run through an example of how I use my C compiler. Using MS-DOS 2.11, I format my disks in single-sided, nine-track format (I have two single-sided drives); if I format a disk without the system (.SYS) or COMMAND.COM files on it, I can fit the DeSmet compiler, linker, and library onto a single disk. On a second disk I copy the 2.11 system files and the fast and handy editor called *SEE* that come free with the DeSmet software. I put this disk in drive A: and use it to boot the system when I start up a programming session; the disk with the compiler software goes in drive B. In my AUTOEXEC.BAT file I set the PATH using the command PATH=\;A:\;B:\ which makes issuing commands from the default drive A: automatically search for the program you want to execute on the B: drive as well. Other setup options abound, depending upon whether or not you have double-sided disk drives or extra memory to allow you to set up a portion of RAM as a phantom disk drive (DeSmet includes a free "RAM disk" program to allow you to do this using MS-DOS 2.11, which works well on the 550/555).

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With my computer set up as described above, I then invoke the *SEE* editor and type in my program in C source code. After previewing the program on the screen for any obvious typographical and syntax errors, I save the program, exit the editor, and compile the source code by typing C88 SOURCE.C (C88.COM is the name of the DeSmet compiler program). The normal option with the DeSmet compiler is to produce a machine language version of your source program, which is called SOURCE.O, directly from the compilation step, bypassing the creation of an intermediate file containing the assembly language version of your C source file. At this point in the process, any syntax or source code problems will show up as error messages, which means that you then have to go back and load your C source program into the editor and make the appropriate corrections.

When you have a program that has successfully compiled without producing any errors, you can invoke the linker program, BIND.COM, by typing: BIND SOURCE.O, which joins the machine language version of your program with those library routines that you need from the library and then puts the whole package of machine code together into a ready-to-run file called SOURCE.EXE.

Now comes the interesting step. At this stage you only have a program that is guaranteed to run, but will it give the desired output? You find out by typing SOURCE and holding your breath. If all goes well, the expected sequence of output or actions will occur and you are finished with that program. However, more often than not, something other than the expected sequence of events or output occurs and you have to go back to the source code, look for your "bug," and begin the compilation process over again.

Sometimes it seems that the process of debugging is what we programmers spend most of our time doing! This step can be a lot less painful when experience and careful programming techniques are used to minimize the time required to get a program up and running. Because of the obviously greater amount of time necessary to debug a program using a compiler-based programming language versus using interpreter-based code, I find that I spend more time thinking out the flow and logic of a program ahead of time on paper rather than just sitting down at the terminal and letting fly. I usually start out by trying to go through the entire programming idea and writing it out in a crude flow chart format, which I later refine into something programmers call "pseudo code." This process amounts to nothing more than a terse description of the principal program steps written in more-or-less normal English phrases that can be translated by you into the syntax of whatever programming language you are planning to use. Although this technique means that you have to spend more time on the front end writing ideas down on paper, I find that it forces me to think critically about the program in such a way that once the code is typed into the computer, I spend much less time and effort debugging it. The tendency when using an interpreter is to try and do your planning and logic while typing the program at the keyboard. This technique is often not the best plan of attack when writing all but the most trivial programs.

As a final note, I would like to point out that some of the most powerful features of your Sanyo 550/555 are accessible through the use of the "interrupts" incorporated into the 8088 processor and MS-DOS operating system. You will have to look at the technical reference section of your Sanyo manual, pages 5-19 to 5-27, to see what interrupts are present, and I'm sure that if you have had much experience with the Sanyo documentation, you won't be very surprised when I tell you that the information in this section is quite incomplete. Don't worry — you don't have to understand all the details of these interrupts. All I want you to be aware of is that interrupts are used by assembly language programs as an easy method of accessing both the screen-oriented and high-resolution graphics capabilities of your Sanyo.

In the case of the screen graphics, these interrupts for the 550/555 are completely accessible in C thanks to a special library of screen and keyboard functions — included with the DeSmet compiler — that was written for the IBM PC, but that also works fine on the Sanyo 550/555. These functions allow you not only to move to any row and column on the screen (like SBASIC's LOCATE command) and print a string or any character (including special graphics characters), but also to scroll and write in any rectangular portion of the screen to create a "windows" effect. This special library of screen oriented functions is written in assembly language and the assembly language source code is included with the DeSmet compiler so that it is possible to follow their examples and incorporate your own assembly language library functions for high resolution graphics into the special library. I have successfully done this and, while it is not something every beginning programmer will want to do, it does show the capabilities of C and this compiler.

The Sanyo MBC-550/555 is a great computer available at a great price. As more and more Sanyo owners become aware of the features and capabilities of this computer, our pool of knowledge will continue to grow. We will all benefit immensely from sharing information through the use of a publication like SOFT SECTOR, which serves an ever-widening audience of Sanyo users.

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Listing 1: WSCLEAN.BAS. This simple utility program will be very useful to anyone who has to convert files in *WordStar* format to a simple ASCII format, for example when sending a file to another computer via a communications program. The REM statements make it pretty self-explanatory, but basically what it does is remove all of the non-printing, or control characters (they have ASCII decimal values less than 31), except for tabs, line feeds, form feeds and carriage returns. The program also converts those characters that *WordStar* has set with the eighth bit "high" (they will all have ASCII values greater than 127). Don't get impatient when running this program; it takes a while to do all this work a character at a time when you are using an interpreter.

```
1ØØ DEFINT A
11Ø CLS
12Ø INPUT "ENTER THE NAME OF THE WORDSTAR FILE";WSFIL$
13Ø INPUT "ENTER THE NAME FOR THE NEW ASCII FILE";ASCFIL$
14Ø OPEN "I",#1,WSFIL$: '   OPEN THE WS FILE FOR READING
15Ø OPEN "O",#2,ASCFIL$: '  OPEN THE OUTPUT FILE FOR WRITING
16Ø WHILE NOT EOF(1): '     CHECK FOR END OF INPUT FILE
17Ø ACHAR = ASC(INPUT$(1,1)): ' GETS INPUT A CHAR AT A TIME AS INT
18Ø IF ACHAR < 127 THEN 2ØØ: ' CONVERTS CHARS WITH 8 BIT HIGH TO
19Ø ACHAR = ACHAR-128: '      NORMAL ASCII CHARS
2ØØ IF ACHAR > 31 THEN 23Ø: ' PRINT REGUALR CHARS DIRECTLY
21Ø IF ACHAR=9 OR ACHAR=1Ø OR ACHAR=12 OR ACHAR=13 THEN 23Ø
22Ø GOTO 25Ø
23Ø AOUT$ = CHR$(ACHAR): '    CONVERT INTEGER TO CHAR FOR WRITING
24Ø PRINT #2,AOUT$;: '        COPY CHAR TO OUTPUT FILE
25Ø WEND: ' END OF WHILE LOOP
26Ø CLOSE: '       CLOSE INPUT AND OUTPUT FILES
27Ø PRINT "CONVERSION OF WORDSTAR FILE TO ASCII FORMAT FILE COMPLETED..."
28Ø BEEP:  '       WAKE UP THE PROGRAMMER!!!
29Ø END
```

Listing 2: WSCLEAN.C. Here is a listing of a C program that is written to do exactly the same thing as the BASIC program shown in Listing 1. The program appears to be longer than Listing 1 because the code includes some error checking for the proper format of the information inputted by the user and because opening files for reading and writing in C is a bit more complicated (and also more versatile) than similar operations in BASIC. In terms of speed, the compiled version of the C program processes the *WordStar* text file made up of the captions for Listings 1 and 2 in nine seconds; the BASIC program takes 75 seconds to do the same task. This comparison does not include the extra time it takes to invoke the BASIC interpreter and load and run the BASIC source code.

```
#include "stdio.h"

main(argc, argv)
int argc;
char **argv;
{
        int achr;
        char outfile[8Ø];
        FILE f1,fopen();
        FILE f2;

        if (argc != 2)
        {       puts("\nUsage: program_name file_name");
                exit(Ø);
        }
```

```
        if ((f1 = fopen(argv[1], "r")) == NULL)
        {       printf("I can't open %s\n",argv[1]);
                exit(Ø);
        }

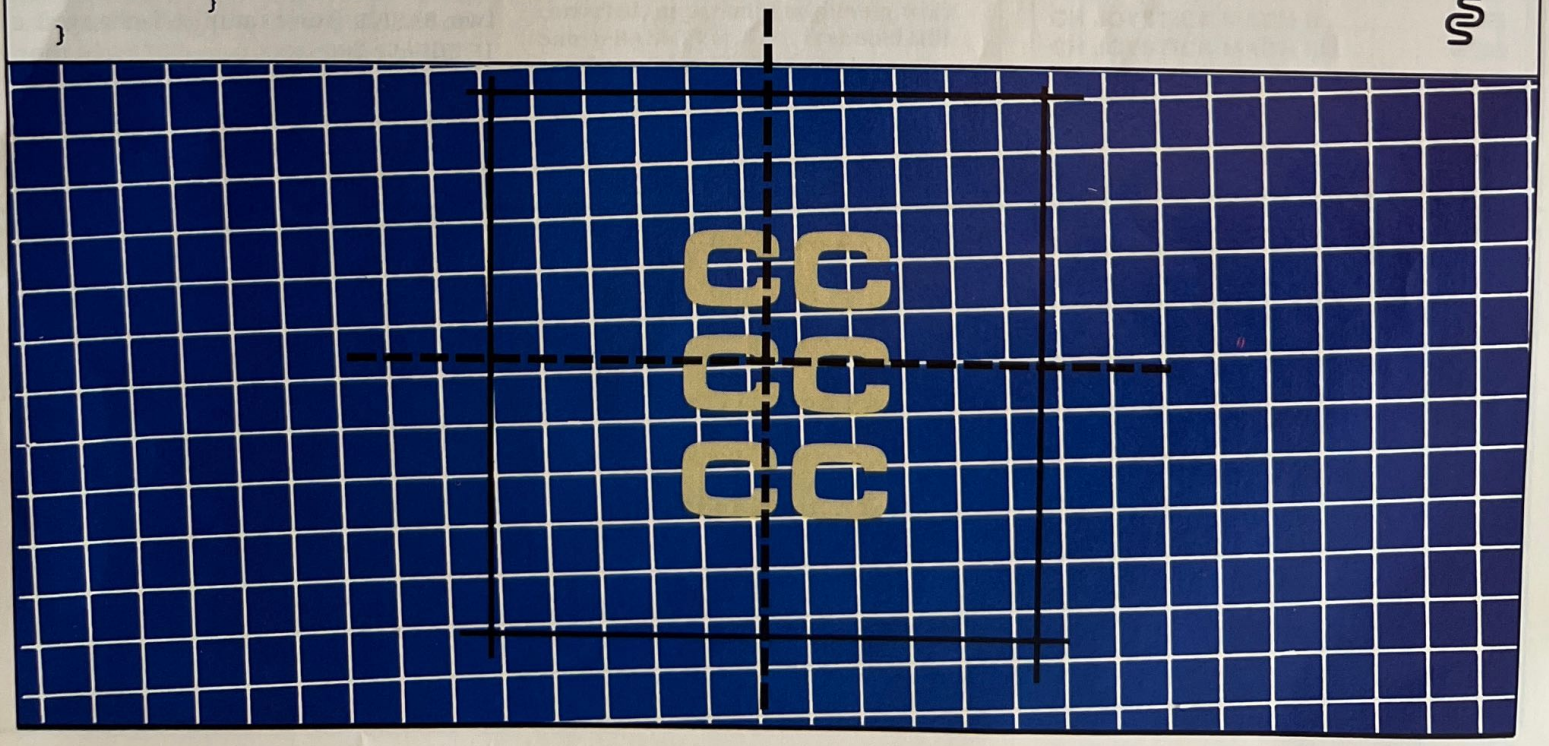
        filnam(outfile);

        if((f2 = fopen(outfile, "w")) == NULL)
        {       printf("I can't create %s\n",outfile);
                exit(Ø);
        }
        while ((achr = fgetc(f1)) != EOF)
        {       if (achr > 127)
                        achr = achr-128;
                if (achr>31 || achr==9 || achr==1Ø || achr==12 || achr==13)
                        fputc(achr,f2);
        }
        fclose(f1);
        fclose(f2);
}

/* function to read the name of a file from the keyboard */
/* usage:  filnam(fname) --- where fname[] is a array of chars */
/* of size 8Ø, e.g. fname[8Ø] */

int filnam(fname)
char fname[];
{       int c_count, flag;

        puts("\nFile name must be in standard MS-DOS format.\n");
        flag = 1;
        while(flag)
        {       puts("\nEnter the name of the output file:");
                gets(fname);
                c_count = strlen(fname);
                if(c_count > 12)
                        puts("Filename too long.\n");
                else if(c_count == 12 && fname[8] != '.')
                        puts("Filename and extent cannot exceed 12 chars\n");
                else
                        flag = Ø;
        }
}
```



Incorrect Values For The Sanyo's VAL(A$) Function

By Grant C. McCormick

I use my Sanyo MBC-555-2 in my work at a construction company in Louisville, Ky. Aside from correspondence, estimating, pricing, proposals and record keeping, I also use my Sanyo for the billing. I have a 256K Sanyo, using two double-sided, 40-track drives running MS-DOS 2.11.

I had been using my TRS-80 Model I for these purposes, but switched to the Sanyo because of its higher capacity (both diskettes and memory), and because of the vastly superior performance of *WordStar*. One program I had been using on my TRS-80 — one that I had written myself — took an ASCII file created by *VisiCalc* of our invoices sent out and consolidated the information on total billings to date on each project. I wrote this program several years ago, and it has always run bug-free on my TRS-80 under Microsoft BASIC.

I recently transferred this program to the Sanyo, making appropriate changes for the dialect differences between the two BASICs (for example, I changed a `IF EOF(1) THEN XXX . . . GOTO 100` loop to a `WHILE EOF(1) = 0 . . . WEND` loop). I expected it to run with no problem.

Lo and behold, it did not. I kept

The listing:

```
1Ø ON ERROR GOTO 7Ø
2Ø I% = Ø
3Ø READ A$: IF A$ = "END" THEN END
4Ø I% = I% + 1: PRINT I%, "VAL("; CHR$(34); A$; CHR$(34); ") = "; VAL(A$)
5Ø GOTO 3Ø
6Ø END
7Ø IF ERR = 11 THEN PRINT "'Division by Zero' error.": GOTO 9Ø
8Ø PRINT "Some other error."
9Ø RESUME 5Ø
1ØØ DATA "12345.67", "123456.78", "-123456.78", "123456.", "123456.ØØ"
11Ø DATA "12345678.9Ø", "-12345678.9Ø", "12345678.", "12345678.Ø", "1Ø.ØØ"
12Ø DATA "1.234567E+Ø5", "1.234567D+Ø5", "-1.23456789ØØD+Ø7", "END"
```

getting unexpected and unexplainable errors: "Division by Zero" errors and "Syntax Errors" and "Type Mismatch Errors" that proceeded quickly to drive me out of my mind. Often these errors would happen, not on the first pass through a given line, but on the 20th or 30th pass! Understandably, I found this bothersome.

To make a long story short, I finally tracked the errors down to the Sanyo's VAL(A$) function, which converts a string value to a numeric value. I discovered that the Sanyo BASIC incorrectly evaluates certain strings whose absolute numeric values should be 100,000 or more, *if* these strings contain digits to the right of the decimal point. For example, VAL(''123456.78'') evaluates as 12345678, *not* as the correct 123456.78. On the other hand, VAL(''123456.00'') gives a "Division by Zero" error! These results seem to hold for the BASICs supplied with both MS-DOS 1.25 and MS-DOS 2.11.

The VAL(A$) function does seem to work correctly for integer-valued strings, with or without a decimal point, *if* no trailing zeros follow this decimal point. It also seems to work correctly if the (correct) absolute numeric value is less than 100,000. Therefore, in my program, I added a routine that separated the string into an integer string and a fraction string and evaluated these separately. It then adds these two numbers together to get the correct total.

As a final note, I believe that when the VAL(A$) function is incorrectly evaluated, it messes up the stack and/or memory, which causes the other errors I encountered. Perhaps some reader who can find and disassemble the code for this function can find out just exactly what it is doing. In the meantime, here is a very short program that demonstrates some of the results of the VAL(A$) function. The interested reader is invited to substitute his own strings in the DATA statements to see what comes out.

To date, this is the only bug *I've* found in Sanyo BASIC. Let's all hope this remains true!

Editor's Note: This bug has now been corrected, apparently beginning with Sanyo BASIC Ver. 1.31. It should still be of considerable interest, however, to those using earlier versions and to those interested in the differences and the evolution of the various versions.

The output:

```
 1  VAL("12345.67") =  12345.7
 2  VAL("123456.78") =  12345678
 3  VAL("-123456.78") = -12345678
 4  VAL("123456.") =  123456
 5  VAL("123456.00") = 'Division by Zero' error.
 6  VAL("12345678.90") = 'Division by Zero' error.
 7  VAL("-12345678.90") = 'Division by Zero' error.
 8  VAL("12345678.") =  12345678
 9  VAL("12345678.0") =  0
1Ø VAL("10.00") =  10
11 VAL("1.234567E+05") =  123457
12 VAL("1.234567D+05") =  0
13 VAL("-1.2345678900D+07") = 'Division by Zero' error.
```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A Final Look At EDLIN

DANNY HUMPHRESS
Soft Sector Technical Editor

For the past three months we've been exploring MS-DOS's line editor, EDLIN. On this, the final day of our trip through EDLIN, we'll be taking a look at more of EDLIN's line manipulation commands. These commands allow us to copy and move lines within a file, as well as transport parts of a file to and from the disk drive.

Learning to use EDLIN is crucial to the mastering of the other, more advanced MS-DOS functions. As with learning anything, practice makes all the difference. An ounce of practical experience is worth a ton of tutorials. Not that these tutorials won't help, mind you; they'll serve you well as a springboard for your own explorations.

(Danny Humphress, SOFT SECTOR's Technical Editor, is the owner of a computer software and consulting firm in Louisville, Ky. Danny brings to SOFT SECTOR his extensive experience with small business computers and applications software.)

We'll be using the same CITIES file that we used last month. If you don't have it on disk, create it with *EDLIN:*

```
Atlanta, GA
Chicago, IL
Denver, CO
Los Angeles, CA
Louisville, KY
Miami, FL
Charlotte, NC
Albuquerque, NM
Palo Alto, CA
San Francisco, CA
```

Copy Lines

Often, when editing a large file, situations arise where you need to have the same lines of text in several places throughout the file. EDLIN allows you to type the text once and copy it as many times as you like anywhere throughout the document. This is done with the Copy Lines (C) command.

Copy needs to know three things about what you want to copy: Which lines you are copying, where they will be copied, and how many times will they be copied. The syntax of the Copy command is:

```
line1,line2,line3,count C
```

Line1 is the first line of the block of text to be copied. If you omit this first parameter (start the command line with a comma), EDLIN will begin copying with the current line. Line2 is the last line of the text to be copied. Line3 is the line where you want the text to be copied. Count specifies how many times you want the text copied at Line3. If you omit Count, the text will be copied once.

As an example, we're going to copy Los Angeles, Louisville, and Miami (lines 4, 5 and 6) to between Atlanta and Chicago (lines 1 and 2). We want EDLIN to copy lines 4 through 6 to before Line 2. Type this command:

```
4,6,2C          press ENTER
```

Another EDLIN prompt will appear signaling that the command was successfully completed. To see for yourself, list the file:

```
*1L
   1: Atlanta, GA
   2: *Los Angeles, CA
   3: Louisville, KY
   4: Miami, FL
   3: Chicago, IL
   6: Denver, CO
   7: Los Angeles, CA
   8: Louisville, KY
   9: Miami, FL
  10: Charlotte, NC
  11: Albuquerque, NM
  12: Palo Alto, CA
  13: San Francisco, CA
*-
```

Everything from Chicago to San Francisco was shifted down to make way for the three newly copied lines. The "old" lines were not changed at all other than being renumbered. Notice

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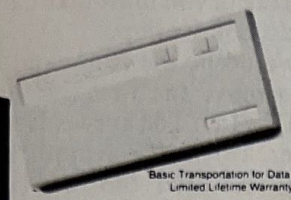

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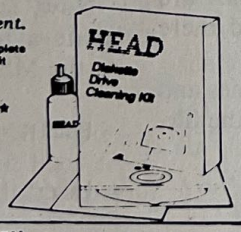

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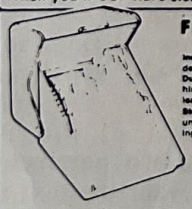

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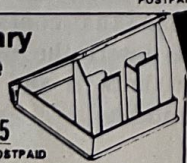

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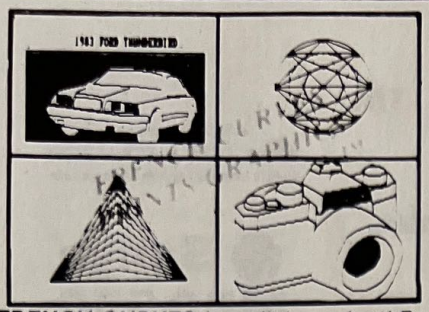

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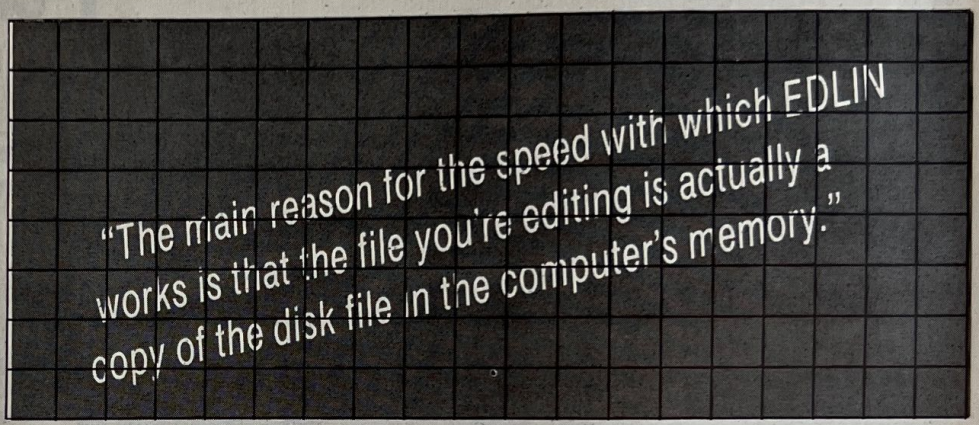
that Line 2 has become the new current line. The first line copied will always be the new current line.

Think about what the following command will do and then give it a try:

```
6,10,8C
```

It will copy lines 6 through 10 to Line 8 . . . right? Wait a minute! Line 8 is *between* 6 and 10 — there is no way to copy a range of lines within itself. Don't worry though, EDLIN will catch on to your sneakiness and stop you cold if you try to pull this one.

What would the command line be if you wanted two copies of lines 10 and 11 between lines 3 and 4 (don't do it now)? If you guessed 10,11,4,2C, you're absolutely right! The fourth number (the count) is the number of times you want to copy the lines.



Move Lines

Once you've mastered Copy, Move is a relatively simple command. The only differences are that the text lines are actually moved (not copied) and there is no count parameter.

Move simply takes a range of lines and moves them to another place in the file. Try this command:

```
1,5,12M          press ENTER
```

The lines 1 through 5 are moved to just before the text in Line 12 and the file is renumbered:

```
*1L
   1: Denver, CO
   2: Los Angeles, CA
   3: Louisville, KY
   4: Miami, FL
   5: Charlotte, NC
   6: Albuquerque, NM
   7: Atlanta, GA
   8: Los Angeles, CA
   9: Louisville, KY
  10: Miami, FL
  11: Chicago, IL
  12: Palo Alto, CA
  13: San Francisco, CA
*-
```

As with Copy, you must take care that the lines do not overlap.

What would be the command if you wanted to move the first five lines to the end of the file? The answer is 1,5,#M. Remember, (#) is the symbol for the imaginary line after the real last line of the file. Since 13 is the last line number, 1,5,14M would also work.

Transfer

Transfer (T) is a very nice feature that you'll really appreciate after using EDLIN for awhile. It lets you take text from another file and insert it into the file you're editing.

For our example, we'll need to exit EDLIN saving our edited CITIES file. Do you remember how to do that? Of course you do — with the E command! Type E and press ENTER.

Now, let's go back into EDLIN and create a new file called . . . NEWFILE. At the MS-DOS prompt, type:

```
EDLIN NEWFILE          press ENTER
```

Insert the following two lines into the file:

```
1: Cities below
2: Cities above
```

Transfer has two parameters, the line where you want the text inserted and the file that contains the text. We want to insert the text from CITIES between lines 1 and 2, so type this command line:

```
2TCITIES          press ENTER
```

Now, take a look at the file in memory:

```
*1L
   1: Cities below
   2: Denver, CO
   3: Los Angeles, CA
   4: Louisville, KY
   5: Miami, FL
   6: Charlotte, NC
   7: Albuquerque, NM
   8: Atlanta, GA
   9: Los Angeles, CA
  10: Louisville, KY
  11: Miami, FL
  12: Chicago, IL
  13: Palo Alto, CA
  14: San Francisco, CA
  15: Cities above
*-
```

As with the other commands, EDLIN will assume the current line if you omit the line number in the command line.

Big Files

The main reason for the speed with which EDLIN works is that the file you're editing is actually a copy of the disk file in the computer's memory. Computers are much faster at shuffling things about in their memory than on floppy (or hard) disks. This has one drawback — it makes it difficult to work with files that are too large to fit in memory.

Fortunately, EDLIN provides a fairly simple way to get around this problem by allowing you to edit large files in portions small enough to fit in memory. When you attempt to edit a file that is larger than 75 percent of your available computer memory, EDLIN will load as many lines as possible. After editing those lines, you can write them back to the file, load the rest of the file and edit it. Append and Write are provided for this purpose.

Write

The Write command (W) writes a specified number of edited lines from the memory back to the disk file. The written lines are removed from memory, freeing space for appending more lines either from the disk file or from memory.

Let's say, for instance, that we have a file of 200 lines that is too large to fit into memory. To make things simple, we'll asume that EDLIN loaded the first 100 lines before running out of memory. After editing the first 100 lines, we would enter this command:

```
100W
```

If there were any lines remaining in memory, they would be renumbered beginning with Line 1.

Append

Append (A) is Write's complement. In the above example of a 200-line file, we would use Append to load in the remainder of the file for editing.

Append takes lines from the disk file and appends them to the end of the text in memory (if any). You may specify a number of lines to append, or let it append until it runs into the "memory 75% full" barrier. To append the rest of the file in the above example, the command would simply be:

```
A
```

If you were to specify a number of lines to append, the command would look like:

```
100A
```

Write and Append are two commands that I use very infrequently. Most of the files that I edit with EDLIN are quite short — certainly not near the limits of a 128K or 256K computer — but it's good to know they are there if you need them.

Multiples

One nice feature that took me months to discover is that you can enter more than one command on a line. For example, if you wanted to replace "IL" with "Illinois" and "GA" with "Georgia" in our sample file and then exit back to MS-DOS old type:

```
1,#RIL^ZIllinois^Z ; 1,
#RGA^ZGeorgia^Z ; E
```

We separated the commands with semicolons here, but in all cases except Search and Replace and single line edit, you can use just a space.

You're Prepared!

With this knowledge of EDLIN — and a little more experience under your belt, you're ready to face the other wonders of MS-DOS. We'll be relying heavily on EDLIN from this point on in "Mastering MS-DOS," so do a little practicing between now and next month. Don't forget that you can use the special line number symbols that we talked about two months ago, '.' and '#,' and relative line numbers '-' and '+' when specifying lines. It takes a bit of getting used to, but once you do, it's oh so easy!

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SOFT TALK

VIDEO RAMifications. Sanyo has announced that there have been some problems with the initial production models of the new Video RAM board, recently released for the MBC-550 series. Apparently, when used on some of the newer 550/555s, the screen characters are malformed, some models may not boot when used in conjunction with an RS-232 board, and the power supply may draw excessive current and cause problems, especially if the co-processor is an 8087.

According to Sanyo, they have already solved all the problems related to the Video RAM Board and the production models currently being sold are in working condition. For those few faulty models that have already been purchased, they may be returned to Sanyo in New Jersey for either upgrades or replacement.

For further information, contact Sanyo Business Systems Corporation, 51 Joseph Street, Moonachie, NJ 07074-1098; (201)440-9300.

* * *

SANYO PAST AND FUTURE is the topic of the February 23 meeting of the New York Sanyo Users' Group. Members may get a free copy of the new MS-DOS Public Domain Catalog which includes over 40 volumes of programs that run on the Sanyo MBC-550/555 series computers. Applications for membership will be available at the registration desk.

Only members may attend. For further information call or write: NYSUG, P.O. Box 182, Times Plaza, Station, NY 11217; (718)855-9029. To order a copy of the Public Domain Catalog, send $3 to the above address.

MEMORABILIA. The Sanyo MBC-550/555 computer with 256K is an outstanding machine and with MichTron's 512K Memory Upgrade kit, it is veritably unbeatable! The 512K memory upgrade requires "piggy backing" memory chips by someone with experience in electronics as intricate soldering is necessary. Now you can have that extra memory that is normally used up by spoolers, keyboard filters, RAM disk drives and the like.

The 512K Memory Upgrade kit is currently available for $249.95, plus $3 S/H including DS-DOS Plus. Contact MichTron, 576 S. Telegraph, Pontiac, MI 48053; (313) 334-5700.

* * *

PLAY IT AGAIN, SAM. Key Software Products has released a program that allows you to play, record, edit, save and retrieve music on your Sanyo MBC-550/555 computer. *Player Piano* is capable of playing in seven octaves. In addition, you can individually control the duration and loudness of each note for syncopation and dynamics while also being able to set the overall tempo and volume.

While in the edit or manual modes, the notes are displayed on the screen and they disappear during normal playback. The built-in editor allows you to change any aspect of each note, including its key, time value, dynamics or octave range by a single keystroke.

Player Piano comes with prerecorded rolls of music, but you can record your own and save them on disk to play again later. It can hold a song in memory with more than 16,000 notes. Played with an average time value of quarter notes at a tempo of 200 beats per minute, that corresponds to about an hour and 20 minutes of music.

Player Piano is currently available for $24.95 from Key Software Products, 440 Ninth Avenue, Menlo Park, CA 94025; (415) 364-9847.

* * *

ON THE MOVE is Parkwyrth Services of Baltimore, Md. Owner Dennis Heffernan would like to thank their customers for making this move necessary and he promises to continue to provide the highest level of customer support. The new address is: 2517 Saint Paul Street, Baltimore, MD 21218; (301) 243-7700.

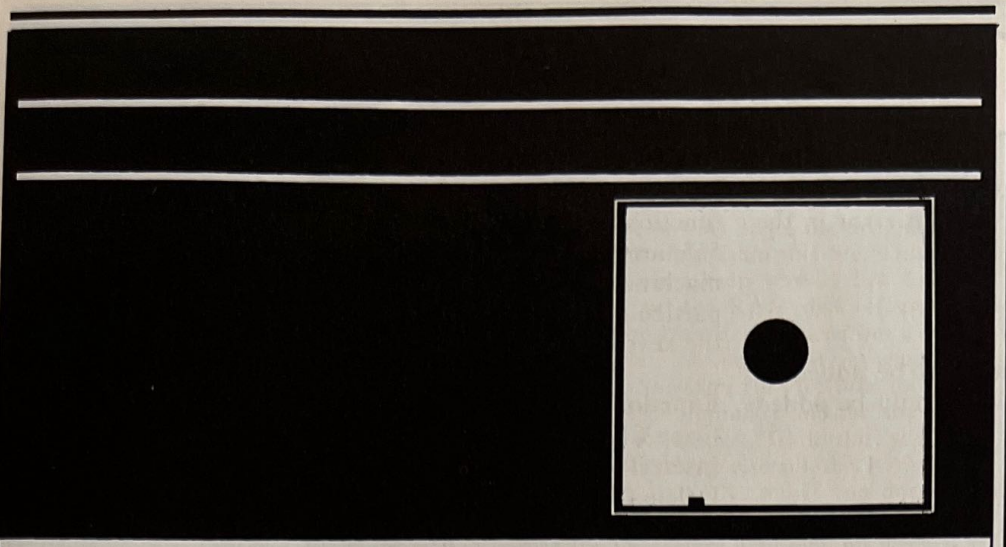
* * *

PICTURE PERFECT. Sanyo Business Systems introduces a new 13-inch color data display monitor designed for the discriminating user who requires top performance from an RGB TTL data display unit. The CRT-50 includes features such as: high resolution, in-line gun, slotted black matrix CRT; accepts RGB, intensity and syncronization inputs at TTL level; intensity input for 16 color RGB; 80 characters by 24 line display capability; and comes incased in an easy-care steel cabinet.

The CRT-50 retails for $449. For further information, contact Sanyo Business Systems Corporation, 51 Joseph Street, P.O. Box 387, Moonachie, NJ 07074-1098; (201) 440-9300.

* * *

MANAGEMENT MADE EASY. The *Total Management Planning/TMP* is a menu-driven database management



system. This means the user does not have to learn a language to operate it — he simply tells the *TMP/Manager* what he wants done. However, languages are available to users who want to learn them to do customization.

TMP/Manager is divided into six sections: Database Dictionary, Data Maintenance, Select/Sort/Tag, Output, Data Transfer and Utilities. This database management system is simple to understand and it gives the user basic tools to design and use applications without any programming experience.

TMP Manager I is currently available for $249.95, plus $3.50 S/H from United Software Company, 2431 East Douglas, Wichita, KS 67211; (316) 684-5281.

* * *

STEP BACK INTO TIME and seek your fortune with MichTron's fast-paced game, *Time Bandit*. You can choose from more than 20 adventure areas — each made up of 15 levels. Stake your claim in Western World, seek the riches of Fantasy World and explore the bizarre future in Space World.

Time Bandit will work on any Sanyo MBC-550/555 computer with at least 128K of memory and a DOS system disk. Although keyboard controls may be used for play, a joystick is recommended.

Time Bandit is currently available for $39.95 from MichTron, 576 S. Telegraph, Pontiac, MI 48053; (313) 334-5700.

* * *

SWAP MEET. Computer Central, a multi-vendor, and trade show will be held in Des Plaines, Illinois on Sunday, March 3 in the Rand Park Fieldhouse, 2025 Dempster/Minor Street. The show opens at 9:30 a.m. and runs until 4 p.m. Admission: adults, $4; children 8-15, $2. For further information, call (312) 940-7547.

* * *

COMPUTER FARE. The University of Washington Academic Computing Center will hold its 11th annual Computer Fair, March 13-14.

Free seminars will be held for professionals in all fields, with special emphasis placed on research, higher education, engineering, manufacturing and communications. There will also be panel discussions on sources of assistance for entrepreneurs, and issues involved in computer-based instruction at universities.

In addition, there is no admission to the exhibits which will include a wide variety of personal computers as well as highly sophisticated CAD/CAM, image processing and network systems. The fair will be held in Seattle on the University of Washington campus. For further information, contact Dr. Thomas Bennett, (206) 543-5728.

* * *

ADDRESS CHANGE. In Soft Talk, January '85, the address for J & M Software was incorrect. The correct address is: 400 Sawyer Rd., Lansing, MI 48910.

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CORRECTIONS

• Mr. John Lesher, author of *Database Manager* (January '85, Page 16), has informed us of a program error in the listing. Line 460 should read:

```
460 IF LENGTH>SPACE2 THEN SPACE2=LENGTH
```

With the above change, a new line must be added to add the extra spaces required. Line 475 should be added as shown below:

```
475 SPACE2=SPACE2+3
```

This portion of the program spaces the record to the right of the field name by an amount greater than the length of the longest field. The same routine is used in lines 2810 through 2830 when a file is being loaded.

• In "Mastering MS-DOS" (November and December '84), Technical Editor Danny Humphress (with the help of a few sharp-eyed readers to keep him on his toes) has discovered a few inconsistencies in the discussion on EDLIN function keys. Some of the keys on the Sanyo MBC-550/555 are different from those on most other MS-DOS machines, including the MBC-775, which is what those particular installments were written with. Here is a list of the keys and their 550/555 equivalents:

Function	MBC-775 Key	MBC-550/555 Key
Copy Character	[→]	PF1
Insert Toggle	INS	PF8
Delete Character	DEL	[→]

Thanks for helping us find these problems. We'll make a greater effort to point out where commands on the two machines differ.

• Another small error was discovered in "The *Run'Round* Challenge" (December '84, Page 28). The article calls attention to the CLEAR statement in Line 20; it should reference Line 40 instead.

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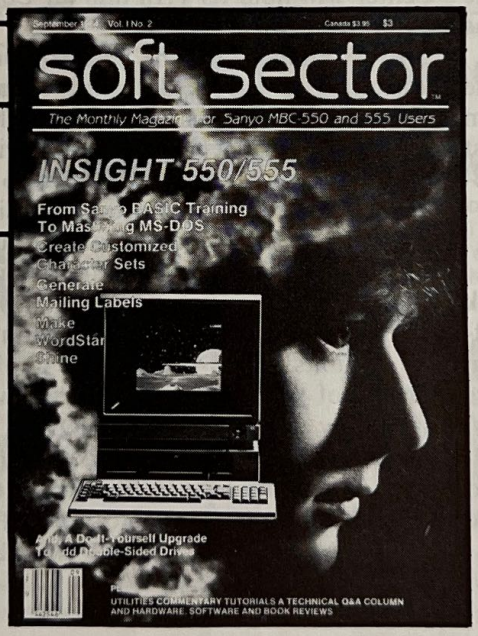

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Continued from page 6

released until about half a page from the end of a print job; with the latter, there is no appreciable difference.) The documentation indicated that this will happen if the application addresses the port directly. *Spooler* works fine with BASIC programs, however.

I'm very happy with *M-Disk*, but your readers might like to know that it does not work well with *CalcStar* under MS-DOS 2.11. The problem is that the RAM disk must contain all of the *CS* overlays, plus COMMAND.COM, which total about 120K. A RAM disk that size under 2.11 doesn't leave much room for spreadsheets. My solution is to use MS-DOS 1.25 for *CalcStar* when I want to use *M-Disk*. DOS 1.25 doesn't take as much memory and the relevant COMMAND.COM is smaller, so one can use a 105K RAM disk and have more memory left for spreadsheets.

Here are some tips for using *M-Disk* with *WordStar*. First, you don't need to have WS.COM on the RAM disk. The overlays and COMMAND.COM are all that is required. If these are on C: drive, you can call *WordStar* with A:WS. WS.COM seems to load into memory anyway.

Second, I would not recommend changing the system drive to C:. If you are logged onto drive C: when you boot *WordStar* and stay logged on this drive, the program will read the overlays from this file. This way, you need only keep WSMSGS.OVR and WS OVLY1.OVR on the RAM disk. If you call *SpellStar* or *MailMerge*, *WordStar* will find these overlays on the A: drive as usual.

Finally, *SpellStar* runs a whole lot faster if you put the dictionary and the document file on the RAM disk. To do this, you have to take everything else off the RAM disk (Including COMMAND.COM). If you do, make sure you don't stay logged onto the RAM disk (or the system may lock up when you leave *WordStar*). Here are two batch files that will set up the RAM disk and put the relevant files on it:

```
AUTOEXEC.BAT
  PAUSE . . Press BREAK to abort;
    otherwise
  MD2/C/128 >NUL
  COPY CONT.BAT C: >NUL
  C:CONT

CONT.BAT
  DATE
  TIME
  COPY COMMAND.COM C: >NUL
  COPY WS*.OVR C: >NUL
  C:
```

Stewart Shapiro
Columbus, OH

Editor's Note: We particularly like the rather novel way that you keep the screen clean by directing the output to nowhere.

IN SEARCH OF USERS

Editor:

I own a Sanyo MBC-555 computer. I am wondering if there are any other people in the Syracuse, N.Y. area that own a 550/555 who would like to start a Sanyo user's group. If there are, would they please write to me at 7869 Hawthorn Dr., 13088.

I would like to know how to print out the directory of the disk on my Okidata 92 Microline printer?

Thank you.

Jay Rosa
Liverpool, NY

Editor's Note: Under MS-DOS 2.11, you can echo the directory or anything else to the printer by toggling the CONTROL-P. Under MS-DOS 1.25, CONTROL-P turns the printer echo on and CONTROL-N turns it off.

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A CURSORY FIX

Editor:

I am writing in response to your query regarding the question asked in the letter from Dave Kircher ("Input/Output," December '84, Page 42) about a modification to *CalcStar's* TERMCAP.SYS file that will substitute the use of the cursor keys for the CTRL commands. My modification, as is, disables the CTRL commands, allowing *only* the use of the cursor pad. Perhaps someone might be able to further my modifications so that both sets of keys will be enabled simultaneously.

The modifications are at Hex addresses 19, 1A, 1B, and 1C. The present values are changed to Hex 4D, 4B, 50 and 48 respectively. Those values correspond to the values returned by the Sanyo and the IBM keyboards.

If anyone figures out how to fix TERMCAP.SYS so that both sets of keys work (or needs further information about this fix), please drop me a line. [Azusa Pacific University, Box 4303, 91702.]

Ramon Rachman
Azusa, CA

DOWN ON PROGRAMS

Editor:

I'd like to suggest that your magazine, while most helpful, is showing an increasing tendency to fill up with long programs to be entered on the computer by the reader. As an example, the stock market article in the current issue takes up 10 pages for the listed program.

I suggest that there are many of your readers, like myself, who are not interested in spending hours to type programs, but who are most interested in learning about applications for the Sanyo. What we would like to know is how to use the capability we have to do things. As examples, let me list stock market analysis (the Dow Jones programs won't run on the Sanyo); genealogy recording (the many fine programs I've found don't run on the Sanyo); and income taxes, both planning and execution.

I suggest there are many who would be most interested in articles on how to do these things with the Sanyo. Spreadsheets are another example: Which run best on the machine? Does *Lotus* represent sufficient improvement over *CalcStar* to warrant buying?

Walter E. Mather
Virginia Beach, VA

Editor's Note: We try to strike a balance between programs and informative articles. Many people are interested in programming in BASIC, which is one of the best "applications" for the Sanyo and for which typing in program listings is one of the best ways to learn. But even beyond learning to program, you say that the Dow Jones programs won't run on the Sanyo — we supplied you with a market forcaster that *will*, and all for the reasonable price of a couple of hours to type it in.

As for *Lotus 1-2-3*, we will soon have a review of the package. Whether it represents a sufficient improvement over *CalcStar* to warrant purchase — considering the additional necessary purchase of the Video RAM Board — will have to be a personal consumer decision.

CONDENSED SOLUTION

Editor:

I have a 555-2 with an Okidata 92 printer. When I run *CalcStar*, I always use condensed mode. To do this, I have to start up the computer, put in the system disk, put in the date any time, and then type the following:

```
A:BASIC
10 LPRINT CHR$(29)
RUN
SYSTEM
A:CS
```

I would like to make my *CalcStar* disk self-loading so that it would ask me for the date only, then send CHR$(29) to the printer, then automatically load *CS*.

Can you tell me how to do this? I have tried to use an EDLIN AUTOEXEC.BAT file to do this without success. It won't send LPRINT CHR$(29) to the printer or COPY CHR$(29) PRN:. Then, after entering the date, it won't load *CalcStar*. What am I doing wrong?

Stan W. Brown
Tarpon Springs, FL

Editor's Note: No sweat! All you need to do is run this BASIC program once to create a file containing ASCII 29:

```
10 OPEN ''O'',1,''CHR29''
20 PRINT#1,CHR$(29)
30 CLOSE
```

Now use EDLIN to create an AUTOEXEC.BAT file as follows:

```
DATE
COPY CHR29 PRN:
CS
```

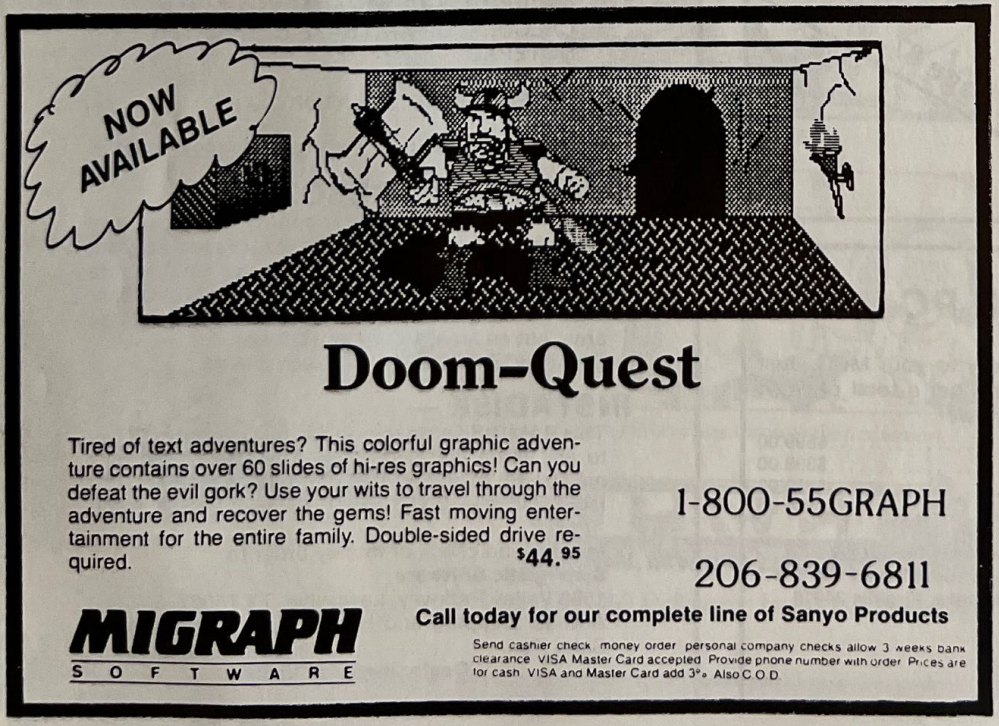
When you boot the disk with this AUTOEXEC.BAT file and the CHR29 file, the computer will ask you for the date, copy the contents of CHR29 (which is an ASCII 29) to the printer, and then go directly into *CalcStar*.

DOWN ON SANYO TOO

Editor:

Please allow me a few comments. I think the magazine is an exciting publication for those of us constantly searching for Sanyo information. Sanyo itself, on the other hand, seems to have assumed the traditional position of a number of hardware manufacturers — that of letting "George" do it when it comes to responding to customer inquiries or complaints.

My recent experience with the purchase of the Sanyo Video RAM Board and its "rush to market" glitches prompts this criticism. Sanyo failed to advise dealers that there are problems with the board and that help is on the way. To the contrary, they come out with the much-ballyhooed 775 IBM clone and nary a word about rescuing those of us with defective boards and early versions of MBC-550s with inadequate power supplies to run the board. Visions of Radio Shack!



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Thanks for your attention. Perhaps you can exert a bit of influence on the boys in New Jersey and remind them that there are user groups out here, and even a little army of — you guessed it — ex-"Shackers." Wonder how we got here?

Harold F. Youngren
S.L.U.G.O.
Omaha, NE

Editor's Note: We don't know what Sanyo relayed to their dealers, but the information we get from them is that all problems with the original release of the Video RAM Board have now been corrected. As reported in "Soft Talk" this month, you and the few others who purchased the first production models can now send your boards to Sanyo for upgrade or replacement.

REVIEWING REVIEWS

Editor:

In response to the review of our software entitled *Spelling Bee*, I believe the review was generally derogatory toward a good program which accomplishes the goals it sets out to do. The reviewer, Mr. Jacobsen, picks at points which make little difference in the performance of the program.

I have identified several points which I believe should not appear in the review:

1) The billboard line at the bottom of the screen is for information, not a sales pitch.

2) The 546 words built into the program are on the disk, but not loaded into memory, as this would greatly add to the time it would take the program to load itself into the computer.

3) A hundred words should be more than enough to learn to spell at one time. Most spelling lists contain less than 100 words to learn at one time.

4) *Spelling Bee* is a drill-type program, not a game. Large graphics are used to make the words readable. However, it is not meant to entertain a young child, only to teach them how to spell.

5) *Spelling Bee* does test you on your spelling skills. How does one learn to spell except by repetition and memorization, which is what *Spelling Bee* accomplishes. *Spelling Bee* works and is a popular program for those who are serious about learning the correct spelling of words through repetition. Repetition is a proven way of learning to spell better.

Byron K. Hiller
Olympic Educational Software
Federal Way, WA

HAPPY LANDING

Editor:

In the January, 1985 issue of SOFT SECTOR, Page 14, Certified Computers of Atlanta, Ga., placed an ad saying "Sanyo 550-IBM Card! Run *Lotus 1-2-3, Flight Simulator,*" etc., with a special price.

In the same issue, in the "Input/Output" column, Tim Purves stated that "after modifying the Microsoft *Flight Simulator*, I have gotten it to function" with the Video RAM Board.

Will the Microsoft *Flight Simulator* run with the new Video RAM Board, or are modifications to the program necessary? If modifications are necessary, what are they? I'm willing to buy the board, but I don't want to get stuck trying to run my favorite program unless I know how to get it to work.

John J. Lochmandy
Carmel, IN

Editor's Note: According to Sanyo's most recent newsletter, the Microsoft *Flight Simulator* will run on the 550/555 with the Video RAM Board installed and a special keyboard patch. The patch is available from Sanyo's Product Support Division by sending a formatted disk and $5.

Continued on page 92

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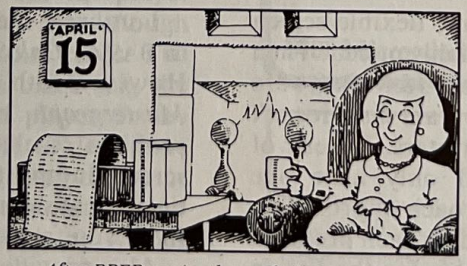

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REVIEWS

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Software review

Video Printer — A Flexible Screen Dump Utility

Have you been looking for an efficient, flexible screen dump which is interrupt driven and reasonably priced? Then look no further, because *Video Printer* from J&M Software meets all these requirements. No, the program disk doesn't come with versions for various brand printers. Instead of useless alternative versions (after all I only have one printer), they have taken the unique approach of providing useful options for the specific version sold on each program disk. Currently there are versions available for the Epson RX-80, Mannesmann-Tally Spirit 80, and the Star Micronics Gemini-10X. Soon to be available is a program for the HP Ink Jet Printer and others are in the development stage to include the Pro-writer and Okidata.

After copying *Video Printer* to a system disk, you merely enter VIDPR at the DOS prompt followed by a RETURN to load the program into memory. A menu of the options and key sequences necessary for their execution will now be displayed on the screen as follows:

The following utilities are now installed:

Utility	Key Sequence
ASCII Character Print	CONTROL PF6
Graphics Print Upright (large)	CONTROL PF7
Graphics Print Upright (small)	CONTROL PF8
Graphics Print Sideways	CONTROL PF9
Printer Form Feed	CONTROL/SHIFT PGUP
To Stop Print Anytime	Press ESC

Below this menu is the DOS prompt, so you are ready to go on about your business immediately.

At first I questioned the usefulness of an ASCII character print. However, after using this utility for a short time, the advantages became very evident. Upon envoking, a screen-wide prompt appears at the top of the screen to indicate the top of the area to be printed. If this is where you want to begin, just press ENTER. However, by using the up- and down-arrow keys this prompt can be relocated accordingly. Next, the same sequence of events transpires with a prompt at the bottom of the screen. The RETURN here activates the printing of only ASCII characters between 32 and 127. While editing a BASIC program you can select and print specific lines, find the problem on a printout, correct, and never leave the edit mode. Being an ASCII print, as opposed to a true screen dump, wear on the printer ribbon is significantly less.

The *Upright Graphics* dump is what you would normally anticipate as the programs sole option. All screen pixels of colors two, three, six and seven are reproduced eight inches wide and are centered vertically and horizontally on the paper.

The Epson version, which I used with a Riteman printer, produces a small image 5¼ inches wide, centered on the paper and both preceded and followed by two line feeds. However, the documentation states that this width will vary between four and 5¼ inches depending on the printer used.

When called, the *Sideways* utility performs just like the *Upright* routine, only at a 90 degree angle. This image is more proportionally accurate than the others for the version tested. Do not confuse this option as the equivalent of *Sideways* by Funk Software. Your spreadsheet will reproduce to equal the screen image and not the entire form as with the reference program.

Printer Form Feed is what it says, and is intended to be used when a routine has been aborted.

I utilized the program's various options at DOS and in BASIC, *CalcStar*, and *dBASE* with no problems at all. However, with VIDPR resident in memory, attempts to load *Mastergraph*, by MichTron, locked up the system. The problem results because this program has a self-loading screen dump utility. This is not a problem once realized, only a consideration for including VIDPR in an AUTOEXEC file if you frequently use this or similar programs.

Also provided with the program disk is documentation which is concise and well presented. The $45 price takes this program out of the bargain basement category for screen dumps. On the other hand, it is a good value for the money, and as usual, you get what you pay for.

(J&M Software, 400 Sawyer Road, Lansing, MI 48910, $45)

— Bob MacDonald

Software review

Black Jack Brings The Casino To Your Home

Black Jack, by A.J. Software, is a program that provides hours of fun for kids and adults alike. The program sells for $15.45. The disk comes with COMMAND.COM (Version 2.11), BASIC (Version 1.25), the *Black Jack* program and an AUTOEXEC batch file.

Starting the game is simple. First turn on your system and insert the disk, the AUTOEXEC batch file will then load BASIC, and execute the *Black Jack* program. The next step is to answer two questions: The first is "Are you using a color monitor (y/n)?" and the second question is "Would you like instructions (y/n)?" A reply of 'N' will bypass instructions; any other reply will display the instructions on the screen. The game is ended when the player finally goes bankrupt or by hitting the BREAK key. To begin a new game after being bankrupt, the player must press the BREAK key and type in RUN or use the PF4 key.

The game allows only one player against the house. The game screen displays the house cards at the top of the screen and the player's cards at the bottom of the screen. A maximum of six cards can be used by the player or the house. The screen also displays the Current Balance, Current Bet and the message, "Would you like to stay (y/n)?" The Current Balance is updated and displayed after every hand.

The rules of the game are quite easy to follow. (Some people know the game as Twenty-one.) To begin with, the player starts with $600. Any amount may be bet, providing there is enough money to cover it. The house then deals two cards to the player. If the two cards equal 21, blackjack, the house pays 1.5 times the bet. If the cards did not hold blackjack, the house asks the player if he wants to stay or if he would like another card. If another is desired, the house gives another card. The player must then make another decision of staying or receiving more cards. A maximum of six cards are used for the player and the dealer. If the player feels that he is near enough to 21 and does not want a hit, the house takes cards. The house must stay on a 17. If the house has blackjack, the player automatically looses. If neither the player or the house gets blackjack, a comparsion is made to determine the winner, which is the one to get the highest points not exceeding 21. The payoff is one-to-one. If the comparison is equal, it is an equal game, meaning there is no winner and no loser.

In addition to the rules, the game also has two options; "Double Down" and "Insurance." Double Down occurs when the player draws between seven and 11 and the house draws between two and six. At this point, the house allows the player to double the bet. However, the bet can only be doubled if there is enough money to cover it. If the bet is doubled, the player receives only one additional card. The house takes its cards and a winner is determined.

Insurance is available when there is a high probability of the house having blackjack. This occurs when the cards are being dealt to the house. If the first card is an ace, the house asks the question, "Would you like to buy insurance (y/n)?" By buying insurance, the player reduces the bet by one-half by deducting it from the current balance. This way the player does not lose all his bet if the house has blackjack. If the house does not have blackjack, the game goes on as usual.

Black Jack can provide hours of enjoyment for an otherwise dull evening. It is easy to use, fun to play and — like most gamblers — the player ends up bankrupt. However, the difference between this and the real thing is that this game costs very little when you lose.

(A.J. Software, P.O. Box 11581, Pittsburgh, PA 15238, 412-963-1754, 412-963-3806, $15.45 plus $1.50 S/H)

— John E. Schlosser

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Software review

Conv3toPC — Transferring Your TRS-80 Model III Files To The Sanyo

I'm sure there are many of you besides myself who own a Sanyo 550/555 in addition to another computer which you've had for a longer period of time. Specifically, I have owned a TRS-80 Model III for over 2½ years and, while I confess to still finding it very useful and satisfying, I saw the handwriting on the wall in early 1984 and knew that IBM PCs, compatibles, and MS-DOS machines were the present and the future. If you look at the decline in the size and number of TRS-80 - specific publications, you know what I'm talking about. But I had, and still have, no wish to abandon my TRS-80, nor the programs that I have been using both happily and successfully for many years.

When the Sanyo came out, I was so intrigued and excited about its price and features that I took my federal tax refund check the very day I got it and ran out and bought the 555. One of the reasons that I did buy it was commercial: I wished to tap the Sanyo and the IBM markets to sell some of the software that I had developed for my TRS-80. I was not sure how I was going to do this, though, since I do not own a modem to effect the transfer from one machine to the other.

In fact, however, 1984 has been a big year for utilities to allow the transfer of files and programs from one machine to another. First for Sanyo users came MichTron's program called, appropriately enough, *Transfer*. And then, *Conv3toPC* was released by Educational Micro Systems for the IBM PC and compatibles.

The *Conv3toPC* package comes in a very attractive manual with two diskettes. One of these contains *Hypercross*, a TRS-80 machine language program, similar to *Transfer*, which is used on that machine for the first phase of the conversion to transfer your program or file to a disk formatted under MS-DOS. Also, it will add the necessary spaces around key words to go from the forgiving TRSDOS operating system to the less forgiving and more demanding MS-DOS. For instance, on a TRS-80 a line such as:

```
10 FORX=1TO10:IFX=ATHENPRINTX:NEXT
```

makes perfect sense, but would cause a Syntax Error under MS-DOS, the Sanyo's operating system. It would have to be edited to read:

```
10 FOR X=1 TO 10: IF X=A THEN PRINT: NEXT
```

in order to be executable.

The second diskette contains the actual program invented by Donald Williams, *Conv3toPC*. It is the one that you use on your Sanyo (or PC or compatible). I feel it important to state at the outset that this program, which can be a very valuable aid in converting programs to run on the Sanyo (or other IBM-compatible machines), was developed expressly for the IBM PC, not for the Sanyo. I mention this because I find it remarkable that I found only a few instances where the difference between the machines mattered at all, and then only to a small degree. In fact, versions of *Conv3toPC*, already available, are completely compatible with the 550/555.

Conv3toPC is a BASIC program. Its purpose is to save you trouble and time. It gives various options for the "finishing touches" in the conversion process. This is the essence of its utility, and it is here that it will really make you smile with delight (at least it did so for me). After you use the linking program (*Hypercross*), your resulting MS-DOS program might still not function on your Sanyo. Why not? Well, there are some differences between TRS-80 BASIC and Sanyo BASIC. (Fortunately, there are more similarities than differences, so don't be overly concerned.) To cite a few, PRINT @ on the TRS-80 needs to be changed to a LOCATE statement, random number generation is different on the two machines, the CHR$ codes vary, and so on. *Hypercross* will not take care of these for you.

This is where *Conv3toPC* shines. It will find every occurrence of a PRINT @ statement, automatically compute the corresponding location, and change it to a LOCATE statement. I observed this to use the same location as though the 80-column monitor were a 64-column one. That is, if you have a statement printed on a TRS-80 which is centered, it will no longer be so on the 80-column screen. *Conv3toPC* cannot do that for you. A few moments of thought persuaded me that it would be impossible to do much with this anyway, due to the many varying needs of different programs.

Program lines with missing spaces or even extraneous spaces (perhaps created by the linking utility) are adjusted automatically. Lines which have telltale, distinguishing features such as RND for random number generation, are flagged. For these, you must make the changes yourself. These flagged messages may be displayed on your screen, your printer, or both. I recommend that they be printed out for easy reference later.

The *Conv3toPC* disk also includes a few separate tiny programs which you can merge with your converted program to handle such matters as TABS and LOCATE statements with variable parameters. These are easy enough to use, as explained in the manual.

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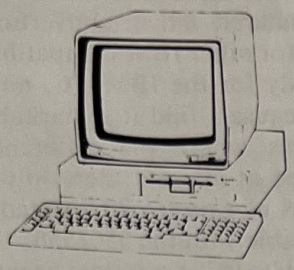

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The manual itself is a three-ring binder with about 30 pages or so, including appendixes. It was mercifully easy to read and apply, with very few typographical errors. It was chock full of useful suggestions for better conversions, evidence that it had been well thought out. I could not think of anything that had been overlooked.

The conversion process is fairly automatic, which I appreciated. On the other hand, since the conversion program *Conv3toPC*, (whose filename is CNV3TOPC, incidentally) is in BASIC, it was a bit slow. One program of 150 lines took between five and 10 minutes for this last "finishing touches" phase. But, to be truly fair, I must allow that it almost surely would have taken me well over an hour, perhaps much more, if I had to list the program a few lines at a time to edit. With *Conv3toPC*, the result is a near-finished program.

You might wonder how a BASIC program can edit another one. Evidently, your program is treated as a file, much like a database file for instance. In a typical session with *Conv3toPC*, you load the program. Now it will present you with options about printing errors, printing original and/or new program lines, inserting line feeds, saving the new program, and so forth. Then it asks for the name of the file (your program on your MS-DOS disk which you transferred via the linking program). It asks for the proposed name of the PC-version file — in this case, your Sanyo program. *Conv3toPC*, treating your program as a file, now loads it and edits it as I've already described. It then saves the program using the filename you've provided. One nice feature is that it will warn you if your proposed filename duplicates an existing one before the conversion itself, so there is no danger of overwriting.

Sanyo vs. IBM

Since this utility was not originally designed for the Sanyo, there were bound to be some problems which need be attended to. I called Mr. Williams of Educational Micro Systems about these and suggested that he make a few changes for future Sanyo users. He assured me that, although he has already had a few Sanyo users with no complaints, he will nevertheless implement my suggestions.

The first is minor, yet critical. It would appear that a REM statement following a command or statement on one program line can immediately follow the command on an IBM, as in:

```
100 IF A = 10 THEN GOSUB 1000 ' TEST A
```

The apostrophe (') is a substitute for REM on most machines. On the Sanyo, however, it must be preceded by a colon (:). I counted six lines where I had to change the *Conv3toPC* program. Williams says he can change this for future buyers with Sanyos. The second item is a peculiarity about which I can only speculate. It concerns "Input past end . . ." type errors, and may relate to EOF (End Of File) garbage. Suffice it to say the following: It seems to be very important to make sure that your transferred TRS program on your MS-DOS disk has END as its last line. If not, add it and re-save your program. Then use that as the file for *Conv3toPC* to fix up.

Support

I found Educational Micro Systems very helpful and supportive. I am pleased to announce that, as a direct result of my contact, Don Williams purchased a Sanyo and, with

it, adapted *Conv3toPC*. As a result,the conversion program will now be available in a slightly modified, special Sanyo version which is not just 98 percent, but 100 percent for the Sanyo.

Summary

This program is a real jewel and a lifesaver if you are interested in the modemless transfer as I've described. The program functioned well even with a slightly modified IBM version, and it should now function flawlessly with the creation of a modified version for Sanyo. It has been a pleasure to use this useful program. In the interests of objectivity, I must say that it may not be for everybody. Since *Conv3toPC* was written for the pricey IBM market, it is not surprising that its $140 price tag is more consistent with that market than with what a Sanyo user might consider normal (whatever that means). The $140 will doubtless scare away the casual hobbyist with not that much which needs to be converted.

Who should use this program then? If you have many not-so-small programs to convert over, or like me, you are interested in modemless transfer and software development for the Sanyo 550/555, IBM PC or compatibles market, this program is for you. The program can be a real timesaver and, in the long run, this can be a very worthwhile investment. The automatic changes and the "flagged for change" lines result in a program which is 95 percent ready-to-go. If you are in the situation of converting programs, it is worth giving serious thought to buying *Conv3toPC*.

(Educational Micro Systems, P.O. Box 471, Chester, NJ 07930, 1-800-922-0786, $139.95)

— Dr. Michael Ecker

Software review

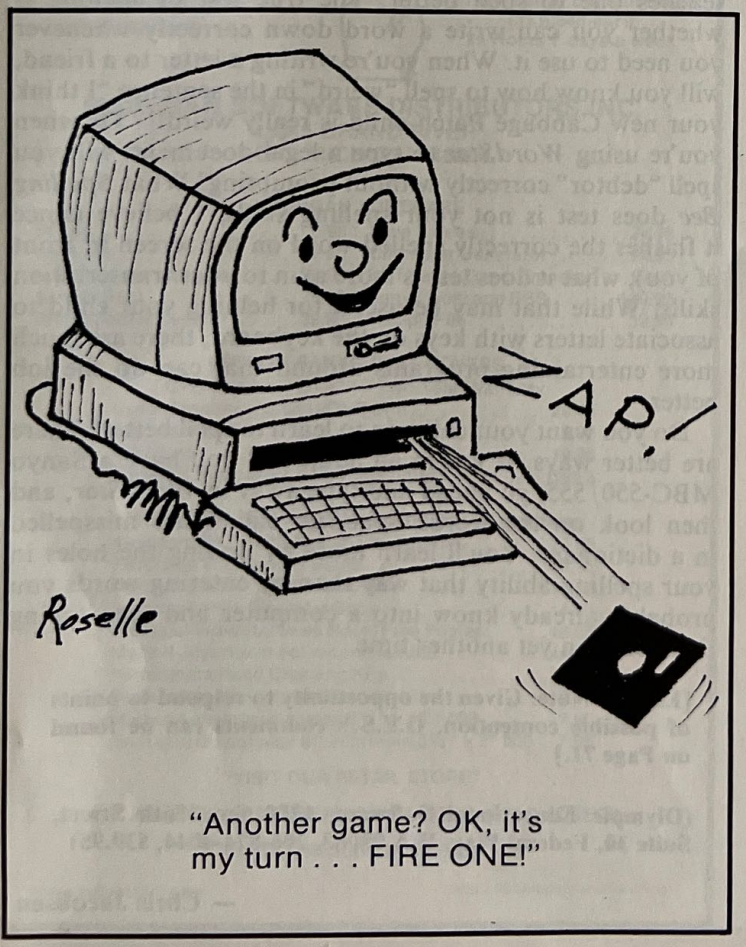
Spelling Bee Spelling Drills For The Family

Spelling Bee is a recent software release from Olympic Educational Software. The program is billed as "a game designed to help you improve your spelling skills," and it is supposedly appropriate for ages five to adult. The program is currently selling for $39.95.

Spelling Bee is very simple to use. The instruction sheet is only one page long and it explains how to use the program in simple language that a grade schooler should be able to follow. (There is, however, one important point about word lists that is not mentioned in the instructions, as I shall discuss later.) All you have to do is turn your computer on and insert the disk into the right-hand drive of your Sanyo MBC-550 or 555 computer; the program, which is written in BASIC, automatically loads itself. After a brief pause, the main menu appears on the screen with the following list of choices:

1) Start Word Drill
2) Enter Word List
3) Load Word List
4) Save Word List
5) Edit Word List
6) Adjust Flash Speed

At the bottom of the screen, a billboard line rolls sort



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of a sales pitch ("Fun for all ages!!!") across the screen while you make your decision.

One annoying feature of the program immediately crops up at this point. Another line at the bottom of the screen informs you that you must have the red light glowing on the "lock" key of your Sanyo. To do this, you simply press the SHIFT LOCK key once; this turns all alphabetical entries you make into capital letters. *Spelling Bee* means business when it tells you this — if it presents a drill word in uppercase letters (and all the words supplied with the program are uppercase) and you type in the same word in lowercase letters, *Spelling Bee* will claim that you typed in an incorrect response. Turning on the SHIFT LOCK is a simple thing to do, but why couldn't the program be written so as to ignore the difference between uppercase and lowercase letters? It's an easy enough thing to include.

Working With Word Lists

In any case, once you have the SHIFT LOCK set, you can start using the program. The first thing you must do is load a word list. *Spelling Bee* comes with 546 words built into the program. Even though they are already there on the disk, you must type '3' to load a word list and answer 'Y' to the question of whether you want to use the preprogrammed word list. You then have an additional choice: you can either test yourself on words selected from the entire list, or you can select only those words with a certain length. The three-letter words seem most appropriate for children — not only are words like "him" and "cat" easy to spell, but they fit in with the everyday vocabulary kids use. The longer words included are much more taxing; they include toughies like "pageant" and "fiery" that would give those ranging from junior high students to rusty adults a challenge.

Of course, you don't have to limit yourself to the word list that comes with *Spelling Bee* — you can also enter your own. Choice four, Enter Word List, allows you to type in a word list of your own making to quiz yourself. A doctor, for example, could type in the words he or she most frequently misspells to use for drills, and a parent could enter words they want their child to know how to spell. The words are then saved as a disk file on the *Spelling Bee* floppy, from where they can be loaded into the program at any time.

At this point, one surprise shows up that is not discussed in the instructions. According to the instructions, the word list you have entered can be edited with option five. Well, one word list that I created had 100 words in it, and I could use choice five to modify it with no problem. When I tried to edit a word list with 101 words in it, however, the computer came up with a blank screen for me to look at. A call to Olympic Educational Software revealed that *Spelling Bee* can handle no more than 100 words in a word list, a point that is not mentioned on the single page instruction sheet. The program will happily let you enter more than 100 words into a file, but you will then have no way of examining (and perhaps modifying) the words in that file. Of course, you can get around that problem by breaking up your word lists into files no more than 100 words long, but then you will only have 100 words to select from for your spelling drill — and if you are really trying to learn a variety of words without repeating the same ones very often, that is a most unsatisfactory compromise. Again, I would think that it would have been relatively easy to have made the program easier to use.

Starting A Word Drill

In any case, once you have a word list loaded, you are ready to begin a word drill. When you select choice one, *Spelling Bee* tells you how many words it has in the list loaded and asks you how many words you want to be tested on. Let's say you type in 20, so that you will be tested on 20 words. What *Spelling Bee* then does is select 20 words at random out of the list you have loaded before beginning the drill. Immediately afterwards, the screen clears and the first word appears in the middle of the screen. Within a second or so (you can vary the time delay with choice five, Adjust Flash Speed, from around half a second to several seconds), the word is painted over, and the computer asks you what the word was. If you type in the correct word, *Spelling Bee* simply says "CORRECT", which might not be flashy enough to reward a five-year-old. If you misspell the word, the computer flashes the word on the screen and quizzes you two more times before moving on to the next word. Finally, at the end of the quiz, the computer tells you how many words you got right (it does *not* penalize you for words that you miss on the first try but catch on the second or third try!) and how long you took to get through the list.

Usefulness

Is *Spelling Bee* a good way to improve your spelling, whether you're five years old or an adult? I think not. First of all, the program is not that stimulating visually — while it does use all light blue lettering on a black background (which shows up as bright lettering on a monochrome monitor), there are no fancy graphics to entertain a young child. For older users, I find it hard to believe that many adults would enjoy sitting down and typing words into a mute computer very often.

More importantly, I question how well the program really teaches one to spell better. The true test of spelling is whether you can write a word down correctly whenever you need to use it. When you're writing a letter to a friend, will you know how to spell "weird" in the sentence "I think your new Cabbage Patch child is really weird!"? Or when you're using *WordStar* to type a legal document, will you spell "debtor" correctly without prompting? What *Spelling Bee* does test is not your spelling skills, I believe (since it flashes the correctly spelled word on the screen in front of you); what it does test is more akin to your transcription skills. While that may be useful for helping your child to associate letters with keys on the keyboard, there are much more entertaining programs around that can do the job better.

Do you want your children to learn to spell better? There are better ways. If you're an adult and you have a Sanyo MBC-550/555, go ahead and type away in *WordStar*, and then look up the words *SpellStar* claims are misspelled in a dictionary. You'll learn more by finding the holes in your spelling ability that way than by entering words you probably already know into a computer and then typing them back in yet another time.

[Editor's Note: Given the opportunity to respond to points of possible contention, O.E.S.'s comments can be found on Page 71.]

(Olympic Educational Software, 1220 So. 356th Street, Suite 30, Federal Way, WA 98063, 206-874-4044, $39.95)

— Chris Jacobsen

Mailer — Mass Mailing Maintenance From Maurizi

Over the last decade, changes in society have created markets for mail-order goods. More women, traditionally the household "buyers," now work full time and have less time for shopping, and the percentage of the population aged 65 and over (a mainstay of the mail-order business) has increased. Higher gasoline prices have made shopping trips less attractive and rising labor costs have caused some retail stores to reduce the size of their sales staffs and the quality of their customer service.

In addition, direct-marketing techniques have become more sophisticated. The key to a successful direct-marketing business is "target" marketing. Target marketing in direct mail means finding and mailing to the segment of the population most likely to buy a specific product.

Many mail-order firms rent mailing lists. Thus comes the need for a software package to manage and use address file data for mailing. *Mailer*, produced by California-based Maurizi Associates, retails for $150. *Mailer* sorts mailing lists by ZIP code (five or nine digits), state, city, name, company name or reference category. It is designed to complement the *WordStar* and *MailMerge* combination, *SpellBinder* and *dBASE II*. This is a very practical and flexible system that enhances the above mentioned products.

Mailer uses a pre-structured screen form and can easily be used with most word processing programs that are capable of doing mail merging. This package features the ability to sort, scan, search, merge address files, and purge and select records. You can print labels (one, two or three across), as well as envelopes. *Mailer* has a database predesigned so that you do not have to set one up.

There is only one word for the documentation presented in this package and that is *excellent*. What a surprise it is to find a software package that completely references and explains all the functions and features presented in the package. The entry, sorting and printing of labels and envelopes is very easy to learn and master. The tutorial supplied with this package is very helpful and informative. I found the documentation very easy to use and the examples were informative.

If your business depends on mailing lists, then this package may be just what you are looking for. You can save time and keep labels organized in a systematic manner by using the *Mailer* package.

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— John Chumney

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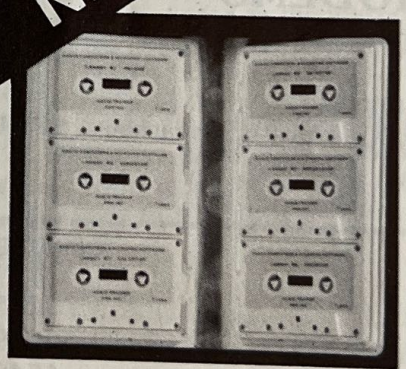

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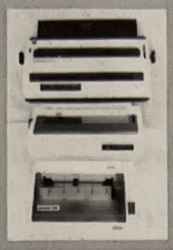

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INPUT/OUTPUT

TIM PURVES
Soft Sector Contributing Editor

Q. *I have tried to access the ESCAPE key (ESC) on my Sanyo MBC-550. The reference manual doesn't show it anywhere. How can I use it?*

J. Hendri
Philadelphia, PA

A. The ESCAPE key returns the value of 1B Hex or 27 decimal. This could be detected in BASIC with an INKEY$ statement such as the following simple program:

```
10 A$=INKEY$:IF A$="" THEN GOTO 10:' Wait for a Key
20 IF ASC(A$)=27 THEN PRINT "He Pressed Escape":GOTO 10
30 PRINT "Sorry Not The Escape Key":GOTO 10
```

Q. *Among the many desirable features of the Sanyo MBC-550, there is one feature which is a constant source of annoyance — namely, the blinking underline cursor. It seems that no matter what software is being used, the cursor has a tendency to get lost. My question is a simple one: Is there any way to change the cursor from a blinking underline to, perhaps, a full inverse video block?*

Allan Bilder
Sicklerville, NJ

A. After my first experience with the Sanyo slightly more than a year ago, my first thought was "a nice computer, but that little cursor has to go." The cursor is generated by inverting part of the green video memory on the screen, so a larger cursor involves inverting a larger area on the screen rather than simply reprogramming a CRT controller. This involves changes in the BIOS — not a simple change for the average user. Since I am the author of DS-DOS Plus and this was my first complaint with the Sanyo, I implemented the enlarged, inverted cursor in my DOS. You may find it interesting to know that some users have asked for that devil-to-find little cursor back!

Q. *I have recently obtained a used IBM PC keyboard but it will not work with the 555. Could a wiring change be made to make it work with the Sanyo?*

Bill Little
Rock Hill, SC

A. The basic difference between the Sanyo keyboard and the IBM is the codes that they return. The IBM returns a value that determines which key is pressed 0 to 83; the Sanyo looks up the ASCII code in a table and converts it to a scan code. So in theory, the BIOS keyboard driver could be modified to accept an IBM keyboard. We would like to hear from someone who attempts this.

Q. *I have just recently upgraded my 555 to 256K of memory but, to my dismay the CHKDSK program only reports 245,248 bytes instead of the expected 262,144 bytes of total memory. What gives! Also, I would like to purchase a dual joystick adapter and a pair of good quality joysticks with a fairly large handgrip. Can you offer any advice?*

Keith Stewart

A. First, the CHKDSK display is OK. The reason for the discrepancy is the fact that the Sanyo BIOS subtracts out 16,384 bytes (16K) for the green screen on a machine with 256K or less. On a machine with more than 256K, the total memory size is actual. On a machine with 512K, the total bytes memory should be 524,288. Also, Sanyo DOS 2.11 subtracts out an additional 512 bytes on a machine with 256K or less. As far as the joysticks, the best heavy-duty sticks I have seen are the WICO Joysticks.

Q. *Where can I find detailed programming guides for the CRT, Interrupts, game ports, and disk controllers? Also, I tried hooking up a pair of Tandon 100-4, 80-track drives. The only response I got was a "Drive not ready" Error. Can you help?*

John LeClerc
Bellevue, NE

A. Concerning the Tandons, the reason that they return a "Drive not ready" Error is because the Sanyo looks at Pin 34 to detect if the drive is ready. MPI drives also have this problem, but they have a board you can add on to give you this signal. On several Sanyos that I have added MPI drives to, I have shorted Pin 34 to ground. I wouldn't recommend this to users that have TEACs on the same drive cable. Shorting Pin 34 to ground doesn't sound too healthy to me.

Secondly, most of the information that I use comes from a large library of books from Intel, Motorola and other manufacturers. Also, I attended the Sanyo school for service repair; the manuals received there are also a great help. Whether these manuals are available to the public, I don't know — a call to Sanyo might help.

(Tim Purves is an expert on the Sanyo 550/555 series computers and is an experienced programmer in assembly code, PASCAL, C and BASIC. He is available to answer any questions that the readers of SOFT SECTOR might have. All questions should be addressed to SOFT SECTOR, P.O. Box 385, Prospect, Ky. 40059.)

Q. *Is there a reasonably simple circuit an electronics hobbiest could build to convert the "Dead Frog" tone to a pleasant, chime-like tone?*

Peter Francis
Bloomington, MN

A. Being somewhat of an electronics hobbiest myself when I first started with computers, I discovered early on that some things can be done more cheaply with software. Hence, this is why I became a programmer. Below are two programs, one is assembly language and the other in BASIC. The assembly language one is the source to a beep program and the BASIC one will create a .COM file that owners without an assembler can run to create a program that will convert the "Dead Frog" tone to a chime-like tone.

The theory of the program is to find the original beep code in the BIOS, and replace it in memory with a more pleasant tone. The program, since it searches the BIOS from beginning to end, should work with any of the DOSs on the market for the Sanyo. Since the patch is in memory only, the program could be run in an AUTOEXEC file. Some enterprising soul could use a "zap" program to find the code in IO.SYS and replace it with the new code and avoid having to execute the program each time they reboot. This program is currently being supplied with DS-DOS Plus for 2.11.

The *BEEP* BASIC Listing:

```
1Ø ' create beep.com 12-1Ø-84 Timothy Purves
2Ø CLS:SYMBOL(2Ø,2Ø),"New Beep Routine",3,3,2
3Ø LOCATE 1Ø,1:PRINT "Program by Timothy Purves":PRINT :PRINT "Creating File .."
;
4Ø OPEN"r",1,"beep.com",1
5Ø FIELD 1,1 AS A$
6Ø FOR X=Ø TO 11
7Ø READ B$,SUM:LSUM=Ø
8Ø FOR Z=Ø TO 15
9Ø TMP=VAL("&h"+MID$(B$,Z*2+1,2))
1ØØ LSET A$=CHR$(TMP):LSUM=LSUM+TMP
11Ø PUT 1,X*16+Z+1
12Ø NEXT:PRINT ".";
13Ø IF LSUM<>SUM THEN PRINT "Error in Data, Line ";X*1Ø+16Ø
14Ø NEXT:CLOSE
15Ø PRINT " Completed.":END
16Ø DATA "EB799ØØDØA4E65772Ø53616E796F2Ø42",1473
17Ø DATA "65657Ø2Ø526F7574696E65ØDØA5Ø726F",1416
18Ø DATA "6772616D2Ø62792Ø54696D6F7468792Ø",1488
19Ø DATA "5Ø7572766573ØDØA24Ø7ØDØA43616E27",1Ø47
2ØØ DATA "742Ø46696E642Ø4F726967696E616C2Ø",1418
21Ø DATA "4265657Ø2Ø436F6465ØDØA24E43AA8Ø1",13Ø5
22Ø DATA "74FA8AC4E638E2F4C3B92ØØØBØ3534Ø8",2157
```


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```
23Ø DATA "E63A8AEØFECC75FCE2F4C3BAØ3Ø1B4Ø9",2521
24Ø DATA "CD21FC33FFBE5CØ1B84ØØØ8ECØ5657B9",2Ø19
25Ø DATA "ØDØØF3A65F5E741Ø4781FFØØ3Ø72EEBA",1784
26Ø DATA "39Ø1B4Ø9CD21CD2Ø83EFØ5BE69Ø1B912",1596
27Ø DATA "ØØF3A4CD2ØØØØØØØØØØØØØØØØØØØØØØ",644
```

The *BEEP* Assembler Listing:

```
code    segment
assume  cs:code,ds:code
        org     1ØØh                ; origin for 'COM' files
start:
        jmp     over_data           ; skip over data

sigon   db      13,1Ø,'New Sanyo Beep Routine'
        db      13,1Ø,'Program by Timothy Purves',13,1Ø,'$'

cnt     db      7,13,1Ø,"Can't Find Original Beep Code",13,1Ø,'$'

;       mov     cx,1Ø
;       mov     ah,Ø                ; DS-DOS is Øaah
oldcode:
        in      al,3ah              ; This is the original Sanyo Code
        test    al,1                ; for bell to ring
        jz      oldcode
        mov     al,ah
        out     38h,al
        loop    oldcode
        ret
oldlen  equ     $-oldcode           ; calculate the length to search

newcode:
        mov     cx,32               ; this is the new code
        mov     al,35h              ; to ring the bell nicely
time:
        xor     al,8                ; toggle break bit
        out     3ah,al              ; issue break toggle
        mov     ah,al
waitr:
        dec     ah                  ; waste some time
        jnz     waitr
        loop    time                ; ring the bell 16 cycles
        ret

newlen  equ     $-newcode           ; calculate the lengh of the new code

over_data:
        mov     dx,offset sigon     ; point to signon msg
        mov     ah,9                ; DOS print string
        int     21h                 ; send to screen
        cld                         ; set direction forward
        xor     di,di               ; set di register to zero
        mov     si,offset oldcode   ; point si at sring to find
        mov     ax,4Øh              ; load ax with the segment of the BIOS
        mov     es,ax               ; now es point at BIOS segment
finde:
        push    si                  ; save pointer to search string
        push    di                  ; save current DOS pointer
        mov     cx,oldlen           ; load cx with the lenght of the search
        repe    cmpsb               ; compare ds:[si] to es:[di] while equal
```

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```
        pop     di                      ; restore DOS pointer
        pop     si                      ; restore search pointer
        jz      foundit                 ; if z flag set we have found it
        inc     di                      ; advance one byte in DOS BIOS
        cmp     di,3ØØØh                ; are we past the end of the BIOS
        jc      finde                   ; if not keep looking
        mov     dx,offset cnt           ; point to not found message
        mov     ah,9                    ; DOS string print
        int     21h                     ; call DOS
        int     2Øh                     ; exit to COMMAND.COM
foundit:
        sub     di,5                    ; real code is 5 bytes back
        mov     si,offset newcode       ; point to replacment code
        mov     cx,newlen               ; length of replacment code
        rep     movsb                   ; move code into BIOS
        int     2Øh                     ; exit to COMMAND.COM
code    ends
        end     start
```

Q. *After reading your column in SOFT SECTOR, Nov.'84, I found a reference in* Byte, *Nov. '83, that states that on the IBM, Interrupt 10h function Och does the write pixel job. Also, how did you find out what Interrupt 10h functions 70h-73h does?*

R.C. Vanderburgh
Dayton, OH

A. Yes, there is code in the BIOS to set a pixel — unfortunately, Sanyo only implemented the color green. Also, it only works in certain modes. My routines work in any mode and in any color supported on the Sanyo. The way I found out about the functions is with my trusty friend DEBUG. DEBUG is my eyes and ears into a program. Below are the results of my findings about functions 70h-73h.

```
function 7Øh:  Get Graphics RAM Address
input:
     ah=7Øh
output:
     ax=the segment of BIOS variables
     bx=pointer to screen offset variable
     cx=pointer to green segment variable
     dx=pointer to red/blue segment variable
```

```
function 71h:  Get Character RAM Address
input:
     ah=71h
output:
     ax=the segment of BIOS variables
     bx=pointer to character screen segment variable
```


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```
     cx=pointer to character screen offset variable

function 72h:  scroll right
input:
     ah=72h
     al=number of rows to scroll
     cx=row/column upper left
     dx=row/column lower right
     bh=attribute to be used on blank line(s)
output:
     screen scrolled

function 73h:  scroll left
input:
     ah=72h
     al=number of rows to scroll
     cx=row/column upper left
     dx=row/column lower right
     bh=attribute to be used on blank line(s)
output:
     screen scrolled
```


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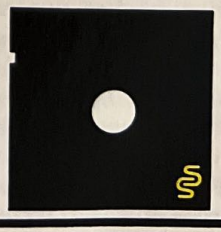

With our constant goal of gaining the utmost control over our computers, MS-DOS provides a means of clustering commands to bring the beast to rein.

The Wonders Of Batch Files

By J. Weaver Jr.

The frequent computer user often finds the need to use the same series of commands or programs, in the same sequence, on a regular basis. Typing these commands in manually can cause many problems: a command may be forgotten or used out of sequence, or may be beyond the understanding of a novice user who needs to operate a system devised by an experienced user. You may also want the computer to perform some set series of tasks every time the computer is powered up; for example, loading a keyboard or hard disk driver, or automatically starting a particular application program. The solution to both these problems is the "Batch" file, a pre-written "script" of DOS commands which the computer can follow to automatically guide the user through a complex task without error. In this article, I'll explain how to create and use batch files, including some fancy commands that are not documented in the Sanyo manuals.

Batch files, distinguished by the extension .BAT, are simply lists of DOS commands and program calls, just as they would be typed in at the DOS prompt. Each line of the file represents one command, and must end in a carriage return. You can create batch files with EDLIN, the MS-DOS line editor, or the "straight ASCII" mode of any word processor (such as *WordStar's* 'N' mode).

A quicker method (under MS-DOS 2.11) is to copy the keyboard directly into a disk file. The DOS command COPY CON TEST.BAT will direct your keyboard input into the disk file TEST.BAT and then you use a CTRL-Z by itself as the last line of input to end the file. Using a batch file is as simple as typing the name of the file (without the .BAT extension) from the DOS prompt.

For example, let's say that you are writing a machine language program called TEST, using *WordStar* as your editor, MASM as the assembler, LINK as the linker, EXE2BIN to convert the finished program to .COM format, and DEBUG to load and test the program. For each change you make to the file, you would need to type in all five of the commands in Listing 1. Typing all of these commands in manually time after time can be very boring, and omitting one by mistake could be confusing or potentially dangerous.

Putting these commands into a batch file named WRITE.BAT would allow you to do the entire process by typing the single command WRITE. Each line of the file would then be executed in turn, just as if you were entering them from the keyboard. First, *WordStar* would be entered and the TEST.ASM file loaded into it. When *WordStar* was exited, the assembler would be called, and so on, through the entire series of commands. When the final command of a batch file is completed, you are returned to the DOS prompt. Any program called from DOS (including BASIC), or any DOS command (such as DIR, DEL or COPY), can be used in a batch file.

The only problem with the WRITE.BAT file is that it is too specific — it's only useful if you're working on the TEST program. To use it with any other project, you would have to create another batch file, replacing TEST with the name of the new program in every line of the file. Fortunately, the % operator allows us to pass parameters (such as filenames) to our batch files.

(J. Weaver Jr. is a free-lance computer programmer and author whose previous efforts include over a dozen published programs for the TRS-80 Models I/III and Color Computer and the Sanyo 550/555. His recent works include Mi-Term, Solitaire *and* Maz. *He is also the National Recording Secretary of CHART [Computer Hobbyists Against Raiders and Thieves]. He can be reached through CompuServe [71446,1362], MCI Mail [FACTPROG] or at WH Enterprises, 859 Winston, Monroe, MI 48161; phone 313-241-WHWH.)*

An improved version of WRITE, called WRITE2.BAT, is shown in Listing 2. To use this batch file to work on the TEST program, you would type WRITE2 TEST at the DOS prompt. The first parameter entered (in this case TEST) will replace the %1 wherever found in the batch file. Using WRITE2 with other programs requires no change in the batch file itself, just a different parameter when calling it. Additional parameters, such as a second filename or a function switch, can be retrieved by using %2 through %9 in the batch file text. The %0 parameter returns the name of the batch file itself, so the command %0 %1 could be added to the end of WRITE2.BAT to make it automatically restart itself, passing the filename along, when DEBUG is exited.

You can also use % to tell a batch file to check the system environment statements for a needed value. For example, if you had previously used the DOS command SET FILE=TEST to define the variable FILE, you could replace the %1 parameter in WRITE2 with %FILE% (note the trailing %), and the batch file would pull the parameter from the environment. This can be especially useful for specifying parameters that change infrequently (such as a drive or a switch) in batch files that will be executed at different times and from different places.

One other thing should be noted about batch files before we proceed to advanced commands: the BREAK key can be used to halt execution of a batch file before it is completed. When BREAK is pressed, the prompt "Terminate batch job (Y/N)?" will appear on the screen. Pressing 'Y' will abort the batch file processing and return you to the DOS prompt, and 'N' will continue from the command *after* the one that was interrupted. This can be useful for skipping one command in a long batch file.

There are many special commands that can be inserted into batch files to make them more productive and easier to use. These commands are listed in Table 1. The first two commands, REM and PAUSE, allow you to put remarks in the middle of a batch file. Anything following the command on the same line of the file will be printed on the screen. The PAUSE command prints the remark and then pauses the batch file execution until a key is pressed. Remarks can be reminders of what the batch file is doing, or even instructions to the user of the batch file, such as when to change disks.

DOS 1.25 users, this is where we lose you — none of the rest of the advanced batch file commands are implemented in your version of DOS. You can skip ahead to the next-to-last paragraph, or stay with us if you've been looking for a good excuse to upgrade. The next batch file command is ECHO, which allows you to control the printing of the command lines as they are executed. ECHO OFF and ECHO ON toggle the printing, while ECHO by itself returns the echo status. Anything else following an ECHO statement is printed as a remark, but without the word ECHO being printed also, which is an improvement over the REM command. ECHO is automatically turned ON at the end of each batch file executed.

SHIFT allows you to shift the parameters passed into the batch file, while the GOTO command transfers program control to another part of the file. WRITE3.BAT (Listing 3) shows these commands added to our previous file to allow for the debugging of more than one file. The colon in the first line indicates a label, LOOP, which is the destination for the GOTO command. When SHIFT is executed, the parameter previously in %2 is moved to %1, the parameter in %3 is passed to %2, and so on. The original contents of %1 are lost. Therefore, calling this batch file with the command WRITE3 TEST1 TEST2 TEST3 TEST4 would cause each of the four programs in turn to be edited, assembled, linked, converted, and tested. SHIFT also allows you to pass more than nine parameters to a batch file — they are shifted into %9 in turn, and from there down to %1 by successive SHIFTs.

There's a slight problem with WRITE3, though; when the last file specified has been processed, and the next SHIFT is executed, nothing remains in %1, and yet the batch file

continues! As a matter of fact, WRITE3 will continue indefinitely until BREAK is pressed to halt it. What we need is a method of telling the batch file when to stop, which leads to our next three commands: IF, NOT and ==. IF allows you to test some condition, such as the existence of a parameter, and process the remainder of that line of the batch file only if the condition is met. NOT reverses the result of the IF test, while == compares two strings for identical values. To clear up our little problem, replace the GOTO statement in WRITE3 with this line: IF NOT ''%1''==''' GOTO LOOP.

Now, after the parameters are shifted, the IF compares the value of %1 to a null string and jumps to the label LOOP only if they are not equal (that is, if there's still something there). Otherwise, control falls through to the next statement and the batch file execution ends.

IF can test for two other conditions with EXIST and ERRORLEVEL. For example, IF EXIST A:TEST.ASM GOTO LOOP executes the jump only if the file TEST.ASM already exists on the disk in drive A:. ERRORLEVEL checks for an exit code sent to the COMMAND processor by the last program executed and returns a "true" condition if the exit code is higher than the number specified. For example, IF ERRORLEVEL 3 GOTO BOMBED-OUT-AGAIN.

The last three commands, FOR, IN and DO, allow for loop processing in batch files, similar to the FOR/NEXT combination in BASIC. Listing 4 is CHKALL.BAT, a one-line batch file I use to check the directories on my hard disk, which is configured as eight drives labeled 'E' through 'L'. The FOR command replaces the parameter %%A (two % required), with each of the values in the set given between the parentheses in turn, executing whatever command follows the DO with each. Any character except '0' through '9' can be used after the double percent sign. Typing CHKALL at the DOS prompt would be equivalent to typing CHKDSK E:, followed by CHKDSK F: and so on through CHKDSK L:. The %1 and %2 parameters allow you to pass along the /F (fix errors) and /V (view files) parameters for the checks. You can also use wildcards in the substitution set: the line FOR %%A IN (*.TXT) DO COPY %%A PRN would send all files with the .TXT extension to the printer. The FOR command can even be used directly from the DOS prompt — just use one % for the parameter instead of two.

Two of the most important batch files any system can have are CONFIG.SYS and AUTOEXEC.BAT. Each time the system is reset or powered up, the DOS is loaded and the first thing the DOS looks for is CONFIG.SYS. This is a special batch file containing instructions for setting certain system options, including the maximum number of buffers and files and any device drivers (for example, a hard-disk interface program) to be installed. The CONFIG.SYS commands accepted by DOS 2.11 are summarized in Table 2. Next, after the COMMAND.COM processor is loaded by the DOS, the AUTOEXEC.BAT file is searched for and executed if found. This is simply a normal batch file, with the added advantage of automatic execution on system reset without user intervention. This is the perfect place for installing memory-resident .COM and .EXE programs: keyboard filters (such as *Mi-Key*), screen drivers (like *Font*), or other "permanent" software (such as *Cornerman*). One caveat: when an AUTOEXEC batch file is found, COMMAND.COM jumps right into it, skipping its usual steps of prompting you for the date and time. If these are important to your applications, the DATE and TIME commands should be included in the AUTOEXEC file.

And so ends our exploration of batch files; as you can see, they offer many ways to speed and simplify the use of your Sanyo. I'll leave you with one more undocumented batch file gem: file nesting. Most texts will tell you that, while you can chain batch files, you can't nest them: that is, one batch file can jump to another, but when the second file ends, it will return to the DOS prompt instead of processing the remainder of the first file. However, there is a sneaky way to get around this limitation by loading another copy of COMMAND.COM into memory with the /C switch. Listing 5 shows 1.BAT and 2.BAT, two short batch files that illustrate this technique. Note that the second file called must end with the DOS command EXIT to remove the second copy of COMMAND.COM from memory and return to the first file.

Listing 1: WRITE.BAT, a batch file to code, assemble, link and test the program TEST.COM.

```
WS TEST.ASM
MASM TEST;
LINK TEST,TEST;
EXE2BIN TEST TEST.COM
DEBUG TEST.COM
```

Listing 2: WRITE2.BAT, an improved batch file, now usable for designing a program with any filename.

```
WS %1.ASM
MASM %1;
LINK %1,%1;
EXE2BIN %1 %1.COM
DEBUG %1.COM
```

Listing 3: WRITE3.BAT, an even better batch file, using the SHIFT and GOTO commands to process multiple files.

```
:LOOP
    WS %1.ASM
    MASM %1;
    LINK %1,%1;
    EXE2BIN %1 %1.COM
    DEBUG %1.COM
    SHIFT
    GOTO LOOP
```

Listing 4: CHKALL.BAT, a one-line batch file to check all directories of an eight-partition hard disk.

```
FOR %%A IN (E:,F:,G:,H:,I:,J:,K:,L:) DO CHKDSK %%A
%1 %2
```

Listing 5: 1.BAT and 2.BAT, demonstration of batch file nesting.

```
1.BAT: ECHO Now in batch file 1.
       ECHO Loading batch file 2 . . .
       COMMAND /C 2
       ECHO Back in batch file 1.
2.BAT: ECHO Now in batch file 2.
       DIR /W
       ECHO Returning to batch file 1 . . .
       EXIT
```

Table 1: Batch File Commands

REM	print a remark on the screen
PAUSE	print remark, wait for keypress
ECHO	control printing of commands
SHIFT	shift parameters
GOTO	transfer control to another part of file
IF	conditional operations
NOT*	reverse sense of IF statement
==	compare two strings
EXIST*	check for existing file
ERRORLEVEL*	check for error from last program
FOR*/IN*/DO*	loop processing (Commands marked * must be in upper case)

Table 2: CONFIG.SYS Commands

BUFFERS = <number>	set # of sector buffers for system list
FILES = <number>	set # of files for XENIX system calls
DEVICE = <filename>	install device driver
BREAK = <ON or OFF>	set frequency of CTRL-C checking
SHELL = <filename>	set COMMAND.COM and COMSPEC locations

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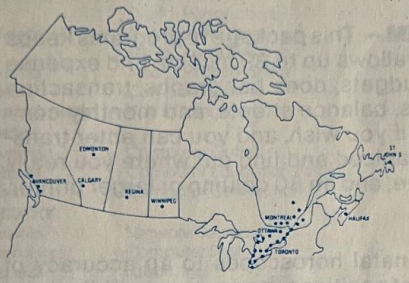

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SANYO

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Continued from page 71

ERROR TRAP

Editor:

Your MS-DOS series refers to the INS/DEL key for inserting and deleting characters in a DOS command line or EDLIN. Why doesn't it work? Part of your commands work with DOS 1.25, part with DOS 2.11. But the right cursor key for display of the template and INS/DEL do not.

I have tried several dealers' copies to see if mine only has this bug. But all of them do. Please explain! By the way, if this is a bug, how did you check out your article? Do these functions work on your DOS?

H.P. Kornick, D.V.M.
Sanford, FL

Editor's Note: OK, you caught us. Some of you are doing your DOS homework. To keep from being repetitious, see the correction on Page 68.

ZEROS AND RUMORS

Editor:

Two weeks ago I bought a Sanyo PR-5000 daisy wheel printer to go along with my MBC-555. When I listed the *Sketch-It* program from the January, 1985 issue of SOFT SECTOR, I noticed that zeros on my printer don't have slashes through them; those in the magazine did.

The slashes preclude any possibility of mistaking an 'O' for a zero and I wish my printer would print them. Can I use print wheels for another printer?

I have had to return my keyboard four times in the last three months to the computer store where I bought it. Each time it was because of a different key that wouldn't print unless it was pressed and held down. The store people have been very good about repairing it, but told me that I'm the only one they know of that has this problem. (I don't hit keys hard — I'm a touch typist!) Have any other readers had the same problem?

Also, [there are published rumors] that leave the impression that Sanyo could very well cease supporting the MBC-550/555 in favor of their new models. Have you heard anything about it? This would be pretty shoddy treatment for those of us that supported Sanyo with our money.

Paul R. Schiffler, Jr.
Toledo, OH

Editor's Note: Taken one at a time, regrettably, most print wheels do not use a slashed zero. We run our program listings through a custom BASIC program that does the trick. Next month (scout's honor) we will publish the program that we use, configured for the Sanyo daisy wheel printers.

We have no knowledge of other users having the keyboard problems that you mention. To memory, no one has contacted us about any problems concerning the keyboard, nor have we experienced any problems with the ones that we use daily (and we sometimes hammer on them). Sorry, but yours must have been produced on Monday morning or something.

As for these published rumors, we can't imagine Sanyo abandoning a proven winner. The release of the Video RAM Board is one example of their continued support of the 550/555. We are confident that Sanyo has adequate resources to support all of their MS-DOS machines and will continue to do so, just as we intend to do.

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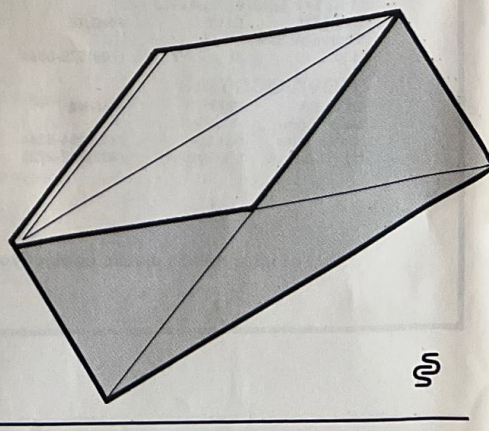

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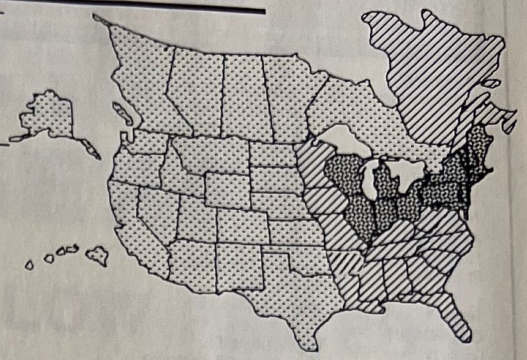

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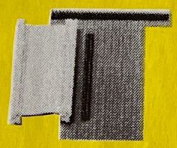

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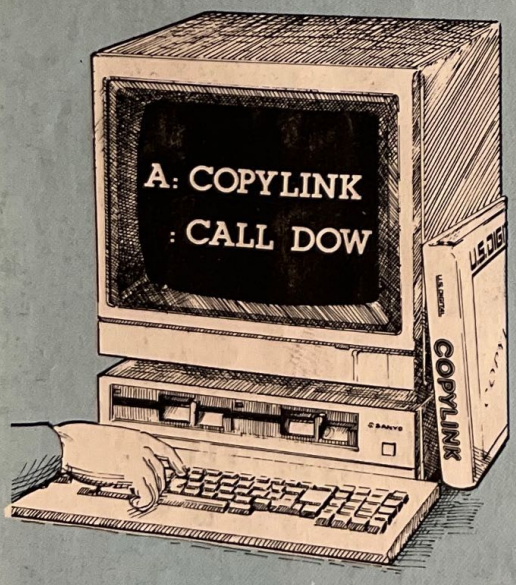

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